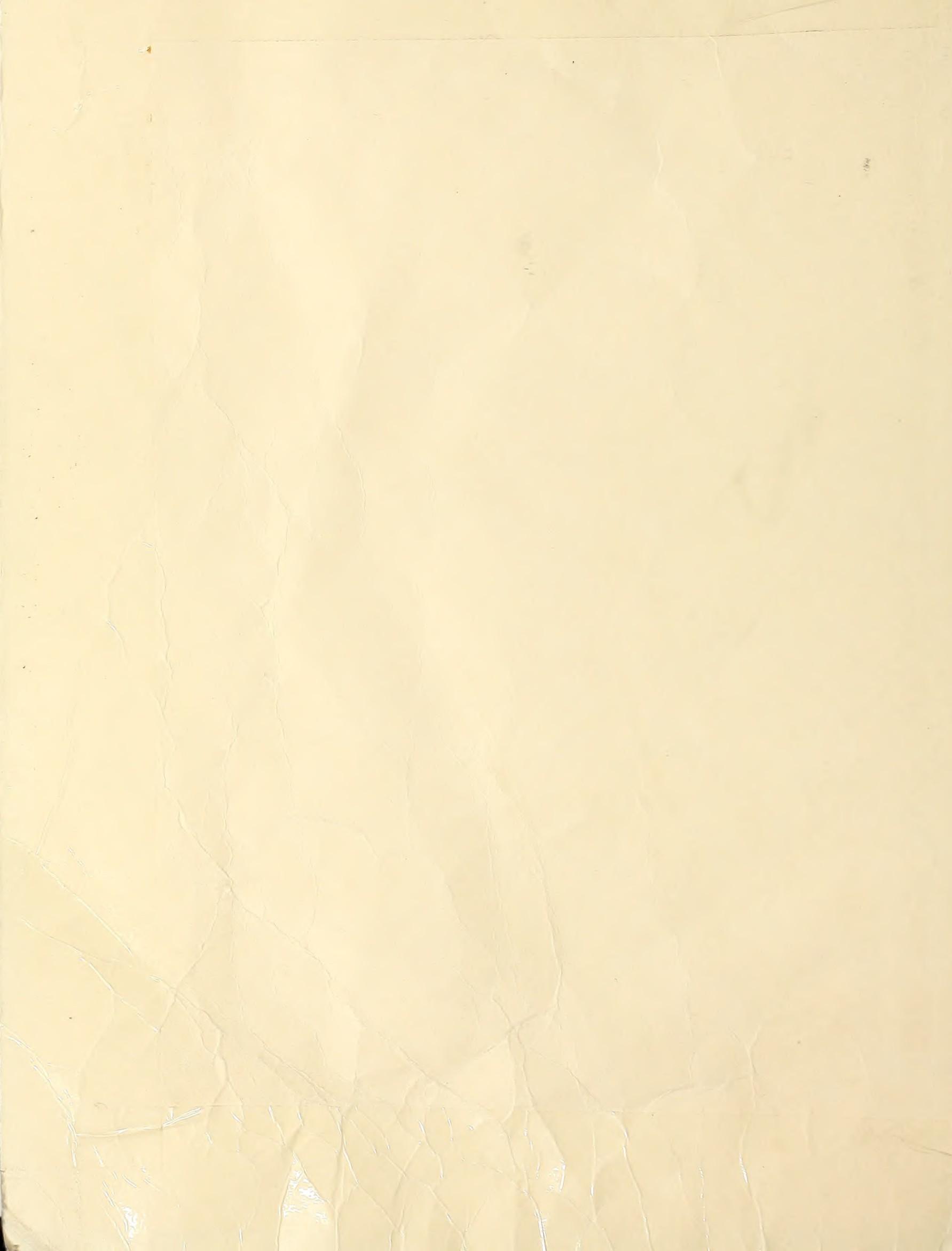


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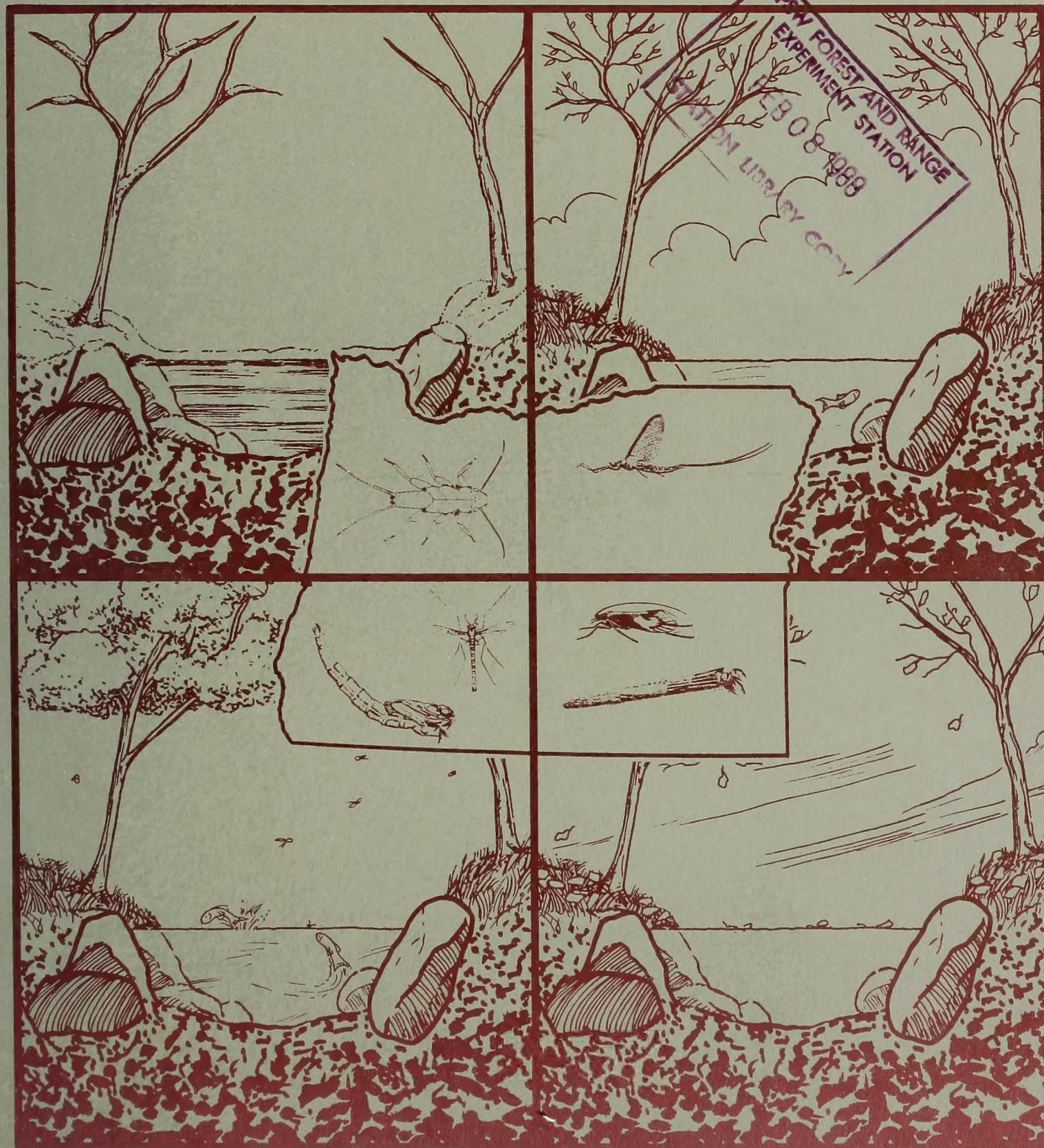
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# Seasonal Composition of Invertebrates in Several Oregon Streams

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## **Abstract**

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The invertebrate communities of eight Oregon streams were sampled seasonally from 1974 to 1976. Benthic, drift, and two types of aerial-trap samples were collected. Occurrence and percentage composition are summarized by sample type, season, and geographic area (coastal, Cascade, central, and eastern Oregon). Within 276 families, 426 taxa were identified; the 20 families most prevalent within each sample type accounted for the majority of organisms collected (77.8-91.8 percent). In most areas and seasons, Diptera and Ephemeroptera together comprised over half of the invertebrates collected.

**Keywords:** Invertebrata, aquatic life, Oregon.

## **Summary**

During 1974-76, we studied the community structure of invertebrates in streams in the coastal, Cascade, central, and eastern areas of Oregon. Benthic, drift, sticky-trap, and water-trap samples were collected seasonally. Occurrence and percentage composition of invertebrates were summarized by sample type, season, and geographic area.

When data for all sample types were combined, Diptera was the most abundant order collected in summer and fall, and Ephemeroptera were prevalent in winter. In most areas and seasons, combined numbers of Diptera and Ephemeroptera comprised over half of the invertebrates collected.

Within the benthic community, Ephemeroptera and Diptera were the most prevalent orders, although other orders such as Coleoptera and Plecoptera occasionally were quite abundant. Ephemeroptera, Diptera, Plecoptera, and Trichoptera were the dominant orders collected in drift samples. Diptera was the most prevalent order collected in sticky-trap and water-trap samples, except for occasional large numbers of Collembola.

Within 276 families, 426 taxa were collected during the study. When data were summarized by family, the 20 most prevalent families accounted for the majority of organisms collected (77.8-91.8 percent).

## **Contents**

- 1 Introduction**
- 1 Study Area**
- 2 Materials and Methods**
- 2 Aquatic Sample Types**
- 2 Aerial Sample Types**
- 3 Sampling Schedule**
- 3 Identification of Organisms**
- 4 Results and Discussion**
- 6 English Equivalents**
- 6 Literature Cited**
- 8 Appendix 1**
- 8 Presence of Taxa by Season and Area**
- 18 Appendix 2**
- 18 Percentage of Samples From Coastal Streams Containing Listed Taxa, by Season and Sample Type**
- 22 Percentage of Samples From Cascade Streams Containing Listed Taxa, by Season and Sample Type**
- 26 Percentage of Samples From Central Streams Containing Listed Taxa, by Season and Sample Type**
- 30 Percentage of Samples From Eastern Streams Containing Listed Taxa, by Season and Sample Type**
- 33 Appendix 3**
- 33 Summary of Invertebrate Data for Each Season and Sample Type—Coastal Streams**
- 34 Summary of Invertebrate Data for Each Season and Sample Type—Cascade Streams**
- 35 Summary of Invertebrate Data for Each Season and Sample Type—Central Streams**
- 36 Summary of Invertebrate Data for Each Season and Sample Type—Eastern Streams**

## Introduction

During 1974-76, we studied the relation of riparian vegetation canopy to the community structure of invertebrates in several streams in Oregon. The composition of invertebrates occurring seasonally in the study streams was evaluated according to several sample types.

The purpose of this report is to provide a list of the invertebrate taxa found in the distinct geographic areas of Oregon in each season. This list will serve as a checklist for other studies of stream ecology in Oregon, and it will be the base of reference for future reports on effects of riparian canopy and food habits.

## Study Area

Eight streams in Oregon were selected for study (fig. 1)—two in each of four geographical areas: coastal Oregon, the west side of the Cascade Range, central Oregon, and eastern Oregon. Thus, a general transect of the State from west to east was sampled. All the study streams were second- or third-order streams, comparable in size, and representative of the small streams that furnish a large amount of rearing habitat for young salmon and trout. The study streams, by area, were:

**Coastal (tributaries of Five Rivers in the Alsea River drainage):**

Green River

East Fork Green River

**Cascades (tributaries of the Lookout Creek system, which drains into the McKenzie River):**

Mack Creek

MacRae Creek

**Central (tributaries of the Deschutes River drainage):**

Ochoco Creek

Canyon Creek

**Eastern (tributaries of the Grand Ronde River):**

Meadow Creek

McCoy Creek

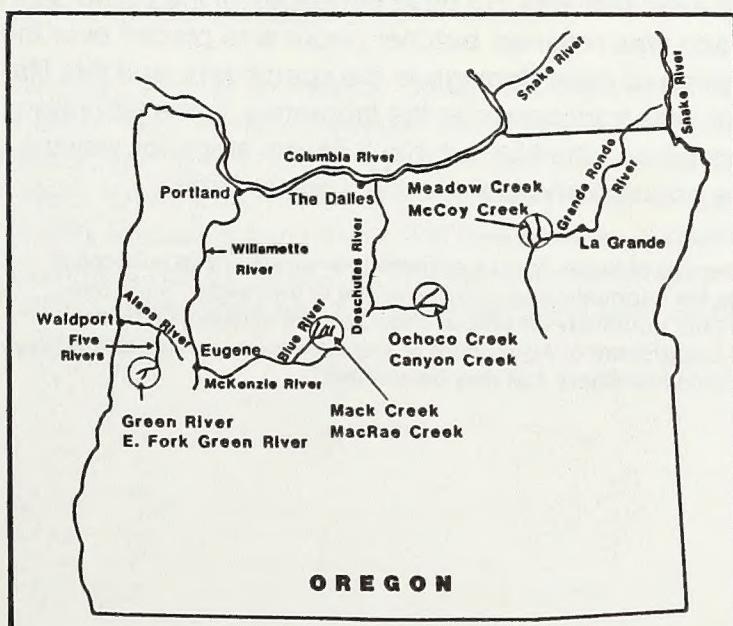


Figure 1—Locations of study streams.

In each of the eight streams, two similar reaches were sampled. Streamside vegetation was a mix of conifers, hardwoods, brush, and grass. Stream substrates were generally similar and ranged from cobble to coarse sand.

## Materials and Methods

### Aquatic Sample Types

**Benthic**—Benthic samples were collected with a modified Hess sampler<sup>1</sup>/ covering a surface area of 0.09m<sup>2</sup>. Two samples were collected from each study reach at the beginning of a 16-day study period and again at the end of the 16 days; the samples were preserved in formal alcohol (half 70-percent ethanol and half 10-percent formalin). In the laboratory, invertebrate organisms were sorted from the samples, counted, and identified to the lowest possible taxonomic level (generally to family and, where feasible, to genus or species). After the invertebrates were sorted, the entire sample was freeze-dried and weighed on an analytical balance to the nearest 0.0001 g.

**Drift**—Aquatic drift was sampled in each study section with a 280-micrometer mesh Nitex drift net, 76 cm long. Openings in the nets were 0.46 by 0.31 m. One drift net was set in place at the lower end of each study reach for 24 hours at the beginning and end of each 16-day sampling period. Nets were placed in riffles or runs with the bottom of the net on the streambed and the top above the stream surface such that the entire water column was sampled. Samples were processed in the field and laboratory as described above.

### Aerial Sample Types

Terrestrial insects and adult aquatic insects that drop into the stream and become part of the drift and potential fish food supply were sampled during each sampling period by means of sticky traps and water traps. A pair (one of each type) was located at each of two sites within each study reach.

**Sticky trap**—The sticky traps were 0.31-m squares of white-painted 6.35-mm plywood; each was covered with a piece of 6-mil clear polyethylene film. This square surface was sprayed with "Tree Tanglefoot," a sticky substance used as a barrier to crawling insects on trees. Each coated board was taped to a Styrofoam float 0.36 m square and 5.1 cm thick. Two sticky traps were set out in each study reach for the full 16 days of each sampling period. When the trap was removed at the end of the sampling period, the plastic film was cut off at the edges of the board so that a 0.31-m-square collection surface was retained, butcher paper was placed over the sticky side to prevent crushing or mold damage to the specimens, and this film and butcher paper "sandwich" was transported to the laboratory. In the laboratory, the butcher paper was removed and the film cut into 2.54-cm strips for viewing under a microscope. Insects were counted and identified, usually to family.

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<sup>1</sup>/ The use of trade, firm, or corporation names in this publication is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval by the U.S. Department of Agriculture of any product or service to the exclusion of others that may be suitable.

**Water trap**—A water trap was made from a 0.33- by 0.28-m plastic dishpan, 0.13 m deep, surrounded by a 0.61- by 0.61-m rectangle of 5.1-cm-thick Styrofoam that supported and floated the pan. The pan was filled to about half its depth with water, and 28.4 g of formalin and 28.4 g of a surfactant (Ortho R X-77 Spreader) were added. The surfactant eliminated surface tension and allowed insects to settle to the bottom. A small hole was bored into a lower corner of the pan and was fitted with a rubber stopper for easy removal of the contents. Two water traps were set out in each study reach for the full 16 days. When a trap was removed at the end of a sampling period, the corner plug was removed and the contents of the pan were strained through a 0.5-mm mesh screen. The material remaining on the screen was washed into a jar with formal alcohol and processed as described for benthic and drift samples.

#### Sampling Schedule

Each stream was sampled during summer and fall 1974 and during all four seasons in 1975 and 1976. Samples were taken at the following times: winter—mid January to early February; spring—early April to late April; summer—early July to late July; and fall—early October to early November.

A sampling period was organized as follows: On day 1, sticky traps, water traps, and drift nets were set out. On day 2, 24 hours later, drift nets were pulled. During these 2 days, benthic samples were taken.

Two weeks later, another sampling trip was made. On Day 15, drift nets were set out, and 24 hours later (day 16), they were pulled. Sticky traps and water traps that had been in place during the 16-day period were removed. During these 2 days, benthic samples were again taken.

Because of ice and other weather-related problems, the winter sampling period at the central and eastern sites in both years, and at the Cascade site in 1976, was only one trip of 2 days rather than two trips over 16 days. During these shortened sampling periods, samples from sticky traps and water traps were not obtained, and only half as many of the other samples were collected. We had planned to collect the following samples during the entire study: benthic, 600; drift, 300; and sticky trap and water trap, 280 each. But actual numbers of samples were fewer because on a few occasions sampling gear malfunctioned or was lost.

#### Identification of Organisms

We used several sources to identify the organisms collected. Invertebrates other than insects were identified through descriptions in Pennak (1978), Ward and Whipple (1959), and Burch (1982). Aquatic insects were identified from taxonomic keys in Hatch (1953, 1957, 1961, 1965, 1971), Usinger (1956), Jensen (1966), Cole (1969), Anderson (1976), Edmunds and others (1976), Baumann and others (1977), and Merritt and Cummins (1978). Terrestrial insects were identified primarily from Borror and others (1976). Amphibians and fish were identified from Stebbins (1954) and Bond (1973), respectively.

## Results and Discussion

Table 1 and figure 2 show the percentage composition by season of the major orders of invertebrates collected in each of the four study areas. In all areas, Diptera was the most abundant order collected in the summer and fall, and mayflies (Ephemeroptera) were prevalent in the winter. In all areas other than central Oregon, spring samples also contained high percentages of mayflies, although springtails (Collembola) dominated the spring samples in central Oregon and stoneflies (Plecoptera) were prevalent in eastern Oregon. In most areas and seasons, Diptera and Ephemeroptera combined comprised over half of the invertebrates collected.

**Table 1—Number and percentage composition of invertebrates, by order, for each season and geographic area**

Area and order	Winter		Spring		Summer		Fall		All seasons	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Coastal:										
Gastropoda	51	(1.8)	207	(1.7)	1,052	(4.6)	615	(4.8)	1,925	(3.8)
Collembola	28	(1.0)	477	(3.9)	85	(.4)	192	(1.5)	782	(1.5)
Ephemeroptera	1,293	(46.6)	5,571	(45.1)	2,479	(10.9)	1,819	(14.1)	11,162	(21.9)
Plecoptera	231	(8.3)	1,158	(9.4)	1,586	(6.9)	1,567	(12.1)	4,542	(8.9)
Hemiptera	6	(.2)	85	(.7)	233	(1.0)	51	(.4)	375	(.7)
Homoptera	5	(.2)	32	(.3)	241	(1.1)	117	(.9)	395	(.8)
Coleoptera	70	(2.5)	1,149	(9.3)	2,517	(11.0)	2,575	(19.9)	6,311	(12.4)
Trichoptera	221	(8.0)	676	(5.5)	995	(4.4)	1,550	(12.0)	3,442	(6.8)
Diptera	832	(30.0)	2,777	(22.5)	13,149	(57.6)	4,108	(31.8)	20,866	(41.0)
Other 1	35	(1.3)	230	(1.9)	501	(2.2)	330	(2.6)	1,096	(2.2)
Total	2,772		12,362		22,838		12,924		50,896	
Cascade:										
Oligochaeta	39	(.8)	231	(1.4)	132	(.5)	183	(1.5)	585	(1.0)
Collembola	574	(12.1)	564	(3.4)	3,031	(11.1)	2,333	(18.8)	6,502	(10.6)
Ephemeroptera	1,734	(36.6)	9,413	(56.0)	4,762	(17.4)	2,063	(16.6)	17,972	(29.3)
Plecoptera	1,327	(28.0)	2,327	(13.8)	1,298	(4.8)	2,250	(18.1)	7,202	(11.8)
Coleoptera	28	(.6)	89	(.5)	832	(3.0)	364	(2.9)	1,313	(2.1)
Trichoptera	564	(11.9)	607	(3.6)	1,311	(4.8)	709	(5.7)	3,191	(5.2)
Diptera	414	(8.7)	3,478	(20.7)	14,563	(53.4)	4,022	(32.4)	22,477	(36.7)
Other	52	(1.1)	104	(.6)	1,367	(5.0)	506	(4.1)	2,029	(3.3)
Total	4,732		16,813		27,296		12,430		61,271	
Central:										
Collembola			14,054	(49.1)	9,046	(24.1)	3,063	(10.0)	26,163	(25.3)
Ephemeroptera	2,076	(32.3)	3,444	(12.0)	4,816	(12.8)	7,464	(24.3)	17,800	(17.2)
Plecoptera	1,865	(29.0)	3,585	(12.5)	922	(2.5)	2,699	(8.8)	9,071	(8.8)
Homoptera			69	(.2)	1,969	(5.2)	1,375	(4.5)	3,413	(3.3)
Coleoptera	205	(3.2)	362	(1.3)	2,269	(6.0)	2,699	(8.8)	5,535	(5.4)
Trichoptera	345	(5.4)	1,192	(4.2)	2,071	(5.5)	2,810	(9.1)	6,418	(6.2)
Diptera	1,873	(29.1)	5,657	(19.8)	14,839	(39.5)	9,777	(31.8)	32,146	(31.1)
Hymenoptera			19	(.1)	586	(1.6)	217	(.7)	822	(.8)
Other	71	(1.1)	242	(.8)	1,040	(2.8)	670	(2.2)	2,023	(2.0)
Total	6,435		28,624		37,558		30,774		103,391	
Eastern:										
Oligochaeta	34	(1.9)	148	(1.8)	28	(.1)	554	(2.2)	764	(1.3)
Gastropoda	19	(1.1)	9	(.1)	34	(.2)	581	(2.3)	643	(1.1)
Araneae			8	(.1)	272	(1.3)	152	(.6)	432	(.8)
Collembola	2	(.1)	442	(5.4)	12	(.1)	245	(1.0)	701	(1.2)
Ephemeroptera	569	(31.5)	563	(6.9)	3,705	(17.2)	5,063	(19.7)	9,900	(17.3)
Plecoptera	446	(24.7)	3,984	(49.0)	1,099	(5.1)	1,342	(5.2)	6,871	(12.0)
Hemiptera	10	(.6)	3	(.0)	211	(1.0)	180	(.7)	404	(.7)
Homoptera	1	(.1)	21	(.3)	1,002	(4.7)	5,426	(21.1)	6,450	(11.3)
Coleoptera	130	(7.2)	128	(1.6)	1,434	(6.7)	1,587	(6.2)	3,279	(5.7)
Trichoptera	124	(6.9)	130	(1.6)	818	(3.8)	1,751	(6.8)	2,823	(4.9)
Diptera	439	(24.3)	2,657	(32.7)	12,350	(57.5)	8,224	(32.0)	23,670	(41.4)
Hymenoptera	1	(.1)	4	(.0)	229	(1.1)	138	(.5)	372	(.7)
Other	30	(1.7)	34	(.4)	287	(1.3)	492	(1.9)	843	(1.5)
Total	1,805		8,131		21,481		25,735		57,152	

1 Other is the total of all orders having a percentage composition less than 1.0 in any season.

Within 276 families, 426 taxa were collected (appendix 1); the 20 most prevalent families within each sample type accounted for the majority of organisms collected (benthos 89.2 percent, drift 80.4 percent, sticky trap 91.8 percent, water trap 77.8 percent—see table 2). Appendix 2 lists the frequency of occurrence, by family, of organisms collected during the study.

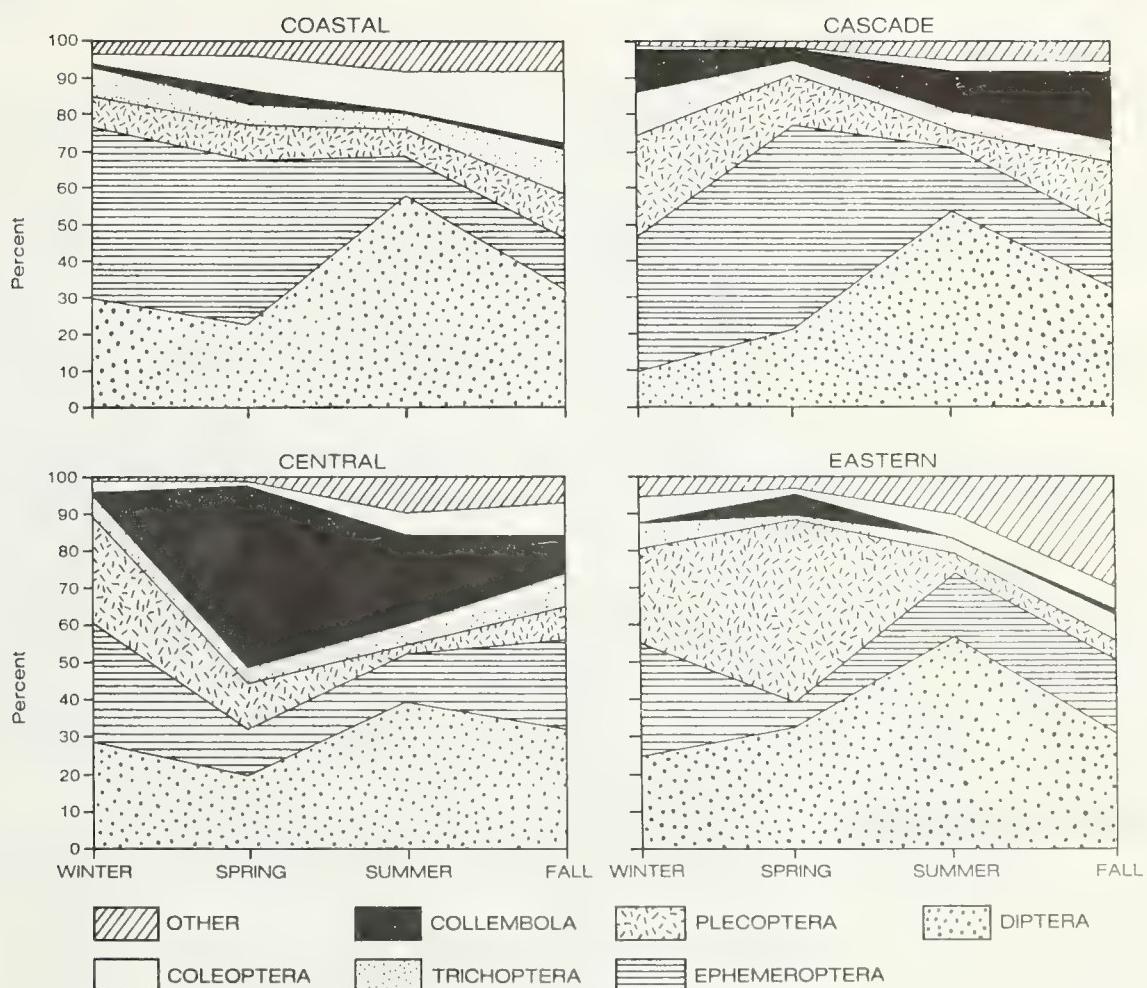


Figure 2—Percentage composition of major orders of invertebrates, by season, for coastal, Cascade, central, and eastern streams in Oregon.

Table 2—Percentage composition of the 20 most prevalent families<sup>1/</sup> collected, by sample type

Benthic		Drift		Sticky trap		Water trap	
Taxa	Percent	Taxa	Percent	Taxa	Percent	Taxa	Percent
Chironomidae	14.4	Baetidae	16.2	Chironomidae	19.0	Chironomidae	24.4
Heptageniidae	13.7	Chironomidae	15.4	Dolichopodidae	12.9	Isotomidae	8.0
Elmidae	10.5	Nemouridae	7.2	Collembola	9.7	Empididae	6.0
Baetidae	7.0	Heptageniidae	5.3	Empididae	9.2	Collembola	5.5
Chloroperlidae	6.4	Ephemerellidae	4.2	Muscoidea	7.7	Ephydriidae	5.1
Ephemerellidae	6.4	Limnephilidae	4.1	Cicadellidae	5.4	Mycetophilidae	4.2
Tipulidae	4.0	Pleuroceridae	3.7	Trichoptera	4.1	Sciaridae	2.9
Leptophlebiidae	3.8	Simuliidae	3.0	Isotomidae	3.6	Tipulidae	2.6
Nemouridae	3.3	Capniidae	2.8	Mycetophilidae	3.5	Dolichopodidae	2.5
Perlidae	2.8	Siphlonuridae	2.3	Nemouridae	3.1	Nemouridae	2.5
Oligochaeta	2.5	Cicadellidae	2.3	Diptera	2.6	Araneae	2.3
Psychodidae	2.4	Elmidae	2.3	Tipulidae	2.0	Aphididae	2.3
Limnephilidae	2.2	Leptophlebiidae	1.9	Sciariidae	1.9	Staphylinidae	1.6
Siphlonuridae	2.0	Sciariidae	1.7	Ephemeroptera	1.9	Ceratopogonidae	1.4
Rhyacophilidae	1.4	Amnicolidae	1.6	Platypezidae	1.3	Cecidomyiidae	1.3
Perlodidae	1.4	Calamoceratidae	1.2	Staphylinidae	1.3	Cicadellidae	1.3
Hydropsychidae	1.3	Chloroperlidae	1.2	Plecoptera	.9	Capniidae	1.1
Capniidae	1.3	Ephemeroptera	1.0	Araneae	.7	Phoridae	1.1
Pteronarcidae	1.2	Psychodidae	1.0	Ephydriidae	.6	Anthomyiidae	.9
Pleuroceridae	1.2	Aphididae	1.0	Chloroperlidae	.4	Simuliidae	.8
Total	89.2		79.4		91.8		77.8

<sup>1/</sup> A few higher taxa are included where identification could not be made to the family level.

When the data are divided by sample type, seasonal and geographic trends become apparent (appendix 3). Within the benthic community, Diptera were more prevalent in summer and fall than in winter or spring in Cascade streams, while in coastal streams they were more prevalent in fall; in central and eastern streams, Diptera were dominant in spring samples. Within the drift, Diptera showed no obvious trend across season or geographic area. Diptera was also the most prevalent order collected in sticky-trap and water-trap samples except for occasional large numbers of Collembola. Ephemeroptera within the benthos were most common during winter and spring sampling; within the drift, their presence peaked during spring and summer sample periods in all areas except eastern Oregon, where they were most numerous in the winter samples. Adult mayflies were never abundant in sticky-trap or water-trap samples. Plecoptera were an important component of winter and spring drift samples collected in eastern Oregon; adult stoneflies also dominated spring water-trap samples in this area. Collembola were occasionally important in all areas except coastal Oregon, but particularly in central Oregon where they comprised over 25 percent of all organisms collected. Collembola were found primarily in sticky-trap and water-trap samples and generally during spring and fall.

## English Equivalents

1 meter (m) = 3.28 feet  
1 square meter ( $m^2$ ) = 10.76 square feet  
1 centimeter (cm) = 0.39 inch  
1 millimeter (mm) = 0.039 inch  
1 micrometer ( $\mu$ ) = 0.000039 inch  
1 gram (g) = 0.035 ounce

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## Appendix 1

### Presence of Taxa by Season and Area

Individuals were identified to the lowest taxonomic level. Presence was recorded at this level and not entered at the broader taxonomic levels.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
Platyhelminthes																
Turbellaria																
Tricladida																
Planariidae	x				x	x	x	x	x	x	x	x	x	x	x	x
Nematomorpha							x									
Nematoda	x	x	x	x	x	x	x	x	x	x	x	x		x	x	
Annelida																
Oligochaeta	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Hirudinea	x	x	x													
Mollusca																
Gastropoda	x	x	x	x	x	x	x					x				x
Basommatophora																
Lymnaeidae																
<i>Lymnaea</i>						x										
Physidae													x	x	x	x
<i>Physa</i>													x	x	x	x
Planorbidae						x										
<i>Helisoma</i>											x	x				x
Ancylidae													x	x	x	x
<i>Ferrissia</i>													x	x	x	x
Stylommatophora	x				x											
Mesogastropoda						x										
Hydrobiidae							x									
<i>Fluminicola</i>	x	x	x	x	x							x	x	x	x	x
Pleuroceridae	x	x	x	x	x											x
<i>Juga</i>	x	x	x	x	x											x
Pelecypoda									x							
Margaritiferidae										-				x	x	x
Sphaeriidae			x	x					x			x	x	x	x	x
Unionidae													x			
Arthropoda																
Crustacea																
Decapoda																
Astacidae																
<i>Astacus (Pacifastacus)</i>		x	x											x	x	x
<i>A. klamathensis</i>														x	x	x
<i>A. leniusculus</i>		x	x										x	x	x	x
<i>A. trowbridgi</i>	x	x	x									x	x	x	x	x
Amphipoda									x	x	x	x	x	x	x	x
Isopoda	x	x	x										x			
Ostracoda						x			x			x				x
Copepoda					x						x				x	x
Arachnida																
Araneae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Acarina	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pseudoscorpionida									x	x	x	x	x	x	x	x
Opiliones	x	x	x					x	x			x			x	

Table continued on next page.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
Insecta																
Thysanura					x		x	x	x	x	x	x			x	
Machilidae	x		x				x	x		x	x	x	x	x	x	x
Collembola	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sminthuridae	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
Poduridae				x			x									
Isotomidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ephemeroptera	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Siphlonuridae	x						x								x	
<i>Siphlonurus</i>							x							x		
<i>Ameletus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Baetidae		x					x			x		x		x		x
<i>Baetis</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>B. bicaudatus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>B. hageni</i>	x		x				x			x						
<i>B. tricaudatus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Centroptilum</i>	x	x	x	x	x		x	x			x	x	x	x	x	x
Heptageniidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Epeorus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>E. sg. lironopsis</i>				x	x	x	x	x	x	x	x	x	x	x	x	x
<i>E. longimanus</i>	x		x			x	x	x	x					x		
<i>E. albertae</i>		x													x	
<i>E. deceptivus</i>					x											
<i>Ironodes</i>					x											
<i>I. nitidus</i>	x		x		x	x	x	x	x	x	x	x	x	x	x	x
<i>Cinygmulia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Cinygma</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Rhithrogena</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>R. hageni</i>							x				x					
<i>R. robusta</i>					x	x	x	x	x							
<i>Stenonema</i>			x		x		x		x			x			x	x
Leptophlebiidae			x		x		x		x			x		x	x	x
<i>Paraleptophlebia</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>P. bicornuta</i>			x		x		x		x							
<i>P. heteronea</i>		x	x		x		x		x						x	x
<i>P. debilis</i>	x		x	x	x		x		x						x	x
<i>P. temporalis</i>	x		x	x	x	x	x	x	x					x	x	x
Leptophlebia															x	x
Ephemerellidae		x					x		x		x	x	x	x	x	x
<i>Ephemerella</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>E. sg. Caudatella</i>					x		x		x		x	x	x	x	x	x
<i>E. sg. Drunella</i>	x	x	x	x	x	x	x	x	x							
<i>E. aurivillii</i>	x				x		x		x							
<i>E. doddsi</i>	x		x	x	x	x	x	x	x							
<i>E. edmundsi</i>	x				x											
<i>E. flavilinea</i>		x				x										x
<i>E. grandis</i>						x	x	x	x						x	x
<i>E. infrequens</i>	x		x	x	x	x	x	x	x					x	x	x
<i>E. spinifera</i>		x	x	x	x	x	x	x	x							
<i>E. tibialis</i>					x		x		x						x	
<i>E. hecuba</i>	x	x	x				x		x					x	x	x
<i>E. margarita</i>							x		x					x	x	x
<i>E. terea</i>	x						x		x					x	x	x
<i>E. coloradensis</i>			x		x	x	x	x	x							
<i>E. jacobi</i>	x				x	x	x	x	x							
<i>E. pelosa</i>						x										
Odonata																

Table continued on next page.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
Anisoptera		x				x							x			
Aeshnidae													x			
<i>Anax</i>													x			
Gomphidae		x											x			
<i>Ophiogomphus</i>													x			
Cordulegastridae									x				x			
Libellulidae										x						
Coenagrionidae																
<i>Argia</i>		x											x			
Orthoptera	x									x	x		x		x	x
Tettigidae										x	x					
Gryllidae										x	x					
Phaneropterinae		x	x	x		x	x	x								
Gryllacrididae		x	x	x		x	x	x								
Acrididae													x			
Dermoptera		x														
Forficulidae												x				
Plecoptera	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pteronarcidae		x	x				x									
<i>Pteronarcella</i>		x	x				x									
<i>Pteronarcys</i>		x	x			x	x	x					x			
Peltoperlidae																
<i>Yoraperla</i>			x	x	x	x	x	x	x	x	x	x	x	x	x	x
Taeniopterygidae																
Brachypteryginae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Nemouridae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Zapada</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Malenka</i>		x		x	x	x	x	x	x	x	x	x	x	x	x	x
Capniidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Capnia</i>		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Isocapnia</i>			x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Eucapnopsis</i>	x		x		x	x			x			x		x		x
Leuctridae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Despaxia</i>		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>D. augustus</i>			x		x	x	x	x	x	x	x	x	x	x	x	x
Perlidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Calineuria</i>		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>C. californica</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Claassenia</i>		x	x	x	x					x	x	x	x			
<i>Hesperoperla</i>	x	x	x	x				x								
Perlodidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Perlodinae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Isoperla</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Perlinodes</i>			x										x			
<i>P. aurea</i>													x			
<i>Skwala</i>			x	x	x	x	x	x	x	x	x	x	x	x	x	x
Chloroperlidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Chloroperlinae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Hastaperla</i>		x														

Table continued on next page.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
Paraperlinae																
<i>Paraperla</i>	x	x	x				x									
<i>Kathroperla</i>					x		x	x								
Psocoptera	x	x				x	x									
Mallophaga	x				x	x										
Thysanoptera	x	x	x			x				x	x	x			x	x
Hemiptera	x	x	x	x		x	x		x	x	x	x	x	x	x	x
Corixidae								x	x	x	x	x			x	x
<i>Graptocorixa</i>																x
<i>Hesperocorixa</i>															x	x
<i>Trichocorixa</i>															x	x
Neididae												x				
Macroveliidae																
<i>Macrovelia</i>						x										
Gerridae	x	x	x	x			x	x		x	x	x		x	x	x
<i>Gerris</i>	x	x	x	x		x	x	x		x	x	x		x	x	x
<i>Trepobates</i>			x							x	x	x		x	x	x
Veliidae	x	x	x							x	x					
<i>Microvelia</i>	x	x	x													
Mesoveliiidae	x															
Saldidae	x	x					x	x		x	x			x	x	
Anthocoridae										x	x			x	x	
Miridae	x	x	x				x	x		x	x			x	x	
Nabidae								x			x			x	x	x
Reduviidae										x	x			x	x	x
Tingidae	x	x	x				x							x		
Aradidae		x									x					
Coreidae							x									x
Lygaeidae	x	x	x				x				x				x	
Pentatomidae		x	x													
Homoptera	x	x	x	x			x	x		x	x	x	x	x	x	x
Cicadellidae	x	x	x	x		x	x	x		x	x	x	x	x	x	x
Cercopidae		x	x				x	x		x	x	x	x	x	x	x
Delphacidae						x	x				x					x
Achilidae							x					x				
Psyllidae	x	x	x	x		x	x	x		x	x	x	x	x	x	x
Aphididae	x	x	x	x		x	x	x		x	x	x	x	x	x	x
Eriosomatidae		x								x	x					
Chermidae					x											
Coccoidea	x		x							x	x			x		
Coleoptera	x	x	x	x	x		x	x		x	x	x	x	x	x	x
Cupedidae												x				
Silphidae											x					
Lathridiidae	x		x				x			x			x			
Noteridae							x	x								
<i>Pronoterus</i>															x	
Carabidae	x	x	x				x			x	x	x	x	x	x	x
Haliplidae										x	x	x	x	x	x	x
<i>Brychius</i>													x	x	x	x
Amphizoidae		x	x	x	x		x	x	x	x	x	x	x	x	x	x
Dytiscidae	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x
<i>Deronectes</i>	x	x								x	x	x	x	x	x	x
<i>Oreodytes</i>	x	x					x			x				x		x

Table continued on next page.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
<i>Agabus</i>	x												x			
<i>Bidessus</i>													x	x	x	x
Hydroporinae						x								x		
<i>Hydroporus</i>							x	x						x		
<i>Hydrovatus</i>	x	x	x			x	x	x					x	x	x	x
Melyridae		x			x											
Gyrinidae	x										x					
Histeridae		x				x						x		x	x	x
Hydrophilidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Paracymus</i>	x					x										
<i>Crenitis</i>	x	x				x					x			x		
<i>Laccobius</i>		x				x					x	x	x	x	x	x
<i>Ametor</i>		x			x	x				x			x	x	x	x
<i>Berosus</i>			x							x				x		
<i>Tropisternus</i>									x							
<i>Helophorus</i>			x	x	x								x	x	x	x
<i>Hydrobius</i>						x										
Hydraenidae (Limnebiidae)	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Hydraena</i>	x					x			x	x	x	x	x	x	x	x
<i>Ochthebius</i>	x		x							x	x	x	x	x	x	x
Melandryidae						x				x				x		
Scarabaeidae						x				x				x		
Cicindelidae						x										
Ptiliidae	x	x	x	x			x			x	x	x	x	x	x	x
Chrysomelidae	x	x	x	x		x	x			x	x	x		x	x	x
Scaphidiidae										x	x	x				
Staphylinidae	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x
Pselaphidae						x				x	x	x	x	x	x	x
Colydiidae		x	x							x				x		
Scydmaenidae											x			x		
Meloidae							x									
Cantharidae	x	x					x				x		x		x	
Lampyridae							x							x		
Curculionidae (Nemonychidae)	x	x	x			x	x			x	x	x				x
Malachiidae										x						
Cleridae						x			x		x	x	x			
Elateridae		x	x	x		x		x			x	x			x	
Eucnemidae							x									
Byrrhidae	x			x			x			x		x	x			
Buprestidae							x				x	x	x			
Dascillidae		x					x									
Ptilodactylidae						x										
Helodidae						x						x				
Dryopidae										x	x					
Limnichidae							x									
Psephenidae							x									
<i>Acneus</i>														x		
<i>A. quadrimaculatus</i>						x										
Elmidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Heterlimnius</i>	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x
<i>Optioservus</i>	x	x	x	x		x	x	x	x				x	x	x	x

Table continued on next page.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
<i>Heterlimnius-optioservus</i>	x	x	x				x			x				x	x	
<i>Narpus</i>		x	x		x		x			x						
<i>N. concolor</i>							x									
<i>Zaitzevia</i>		x	x							x	x	x	x	x	x	x
<i>Lara</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Microcylloepus</i>										x	x	x	x			
<i>Cleptelmis</i>								x		x	x	x				
<i>Dubiraphia</i>										x						
<i>Ordobrevia</i>													x	x		
<i>Ampumixis</i>													x		x	
<i>Scolytidae</i>	x	x					x			x	x	x	x	x	x	x
<i>Derodontidae</i>							x	x		x	x	x	x			
<i>Cryptophagidae</i>	x						x									
<i>Bostrichidae</i>							x									x
<i>Nitidulidae</i>	x	x					x	x		x	x	x	x			x
<i>Cucujidae</i>							x									
<i>Endomychidae</i>	x						x									
<i>Coccinellidae</i>		x	x				x			x		x	x	x	x	x
<i>Cerambycidae</i>	x						x			x		x	x		x	x
<i>Anthicidae</i>		x					x									
<i>Pedilidae</i>													x			
<i>Cephaloidea</i>												x				
<i>Mordellidae</i>							x					x				
<i>Tenebrionidae</i>							x					x				
<i>Neuroptera</i>	x					x		x	x			x		x		
<i>Megaloptera</i>																
<i>Sialidae</i>																
<i>Sialis</i>	x	x	x			x	x	x			x		x	x	x	x
<i>Corydalidae</i>			x	x		x	x	x	x							
<i>Dysmicohermes</i>	x		x	x	x	x	x	x								
<i>Raphidioptera</i>																
<i>Raphidiidae</i>													x			
<i>Planipennia</i>																
<i>Coniopterygidae</i>												x				
<i>Hemerobiidae</i>			x			x		x				x				
<i>Chrysopidae</i>							x	x								x
<i>Trichoptera</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Limnephilidae</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Neophylax</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Hesperophylax</i>		x		x		x		x	x	x	x	x	x	x	x	x
<i>Apatania</i>		x	x	x		x		x	x	x	x	x	x	x	x	x
<i>Dicosmoecus</i>	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x
<i>Ecclisomyia</i>	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x
<i>Lenarchus</i>		x								x	x					
<i>Chryanda</i>	x															
<i>Onocosmoecus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Clostoecea</i>									x							
<i>Goera</i>	x	x	x	x												
<i>Hydatophylax</i>	x								x							
<i>Cryptochia</i>	x								x	x			x			
<i>Psychoglypha</i>										x						
<i>Neothremma</i>						x	x									

Table continued on next page.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
<i>Limnephilus</i>					x			x								
<i>Grammotaulius</i>										x	x				x	x
<i>Philopotamidae</i>	x	x	x	x	x	x	x	x		x	x	x		x	x	
<i>Wormaldia</i>	x	x	x	x		x	x			x	x	x		x	x	
<i>Dolophilodes</i>					x	x										x
<i>Rhyacophilidae</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Rhyacophila</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>R. acropedes</i>					x	x	x	x		x	x	x	x	x	x	x
<i>R. angelita</i>	x					x									x	
<i>R. tucula</i>								x								
<i>R. blarina</i>					x	x		x								
<i>R. narvae</i>						x	x	x	x							
<i>R. vaetes</i>					x	x	x	x	x						x	
<i>R. betteni group</i>					x	x	x	x	x							
<i>R. verrula</i>	x				x	x	x	x								
<i>R. arnaudi</i>					x											
<i>Himalopsycche</i>					x				x							
<i>H. phryganea</i>									x							x
<i>Hydropsychidae</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Hydropsyche</i>	x	x	x						x	x	x	x	x	x	x	x
<i>Arctopsyche</i>		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Parapsyche</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Homoplectra</i>					x											
<i>Cheumatopsyche</i>	x	x			x									x	x	x
<i>Psychomyiidae</i>		x	x	x	x	x	x	x			x	x				
<i>Psychomyia</i>	x	x	x	x											x	x
<i>Polycentropodidae</i>		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Polycentropus</i>		x				x	x	x	x							
<i>Brachycentridae</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Micrasema</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Calamoceratidae</i>						x										
<i>Heteroptectron</i>					x				x							
<i>Lepidostomatidae</i>									x							
<i>Lepidostoma</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Glossosomatidae</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Anagapetus</i>	x	x	x		x	x	x	x		x	x	x	x	x	x	x
<i>Agapetus</i>					x					x	x	x	x	x	x	x
<i>Glossosoma</i>	x	x	x	x		x	x				x	x	x	x	x	x
<i>Phryganeidae</i>		x				x			x		x	x	x	x	x	x
<i>Hydroptilidae</i>	x	x	x	x		x	x	x	x			x	x	x	x	x
<i>Hydroptila</i>						x						x	x	x	x	x
<i>Palaeagapetus</i>							x									
<i>Ochrotrichia</i>								x								
<i>Leptoceridae</i>									x					x	x	x
<i>Lepidoptera</i>	x	x	x			x	x	x	x	x	x	x	x	x	x	x
<i>Pieridae</i>								x								
<i>Lycaenidae</i>					x			x								
<i>Satyridae</i>					x			x					x			x
<i>Hesperiidae</i>					x			x					x			x
<i>Arctiidae</i>						x					x	x	x			x
<i>Noctuidae</i>							x			x	x	x	x	x	x	x
<i>Geometridae</i>	x	x	x			x	x			x	x	x	x	x	x	x
<i>Microlepidoptera</i>	x	x				x	x			x	x	x	x	x	x	x
<i>Pyralidae</i>					x		x					x	x	x	x	x

Table continued on next page.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
Aegeriidae (Sesiidae)							x							x	x	x
Diptera	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Nematocera	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Tanyderidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Tipulidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Limoniiinae														x	x	x
<i>Antocha</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Limnophila</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Dicranota</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Tipula</i>			x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Hexatomata</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Hesperoconopa</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Molophilus</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Psychodidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Psychoda</i>													x			
<i>Pericoma</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Maruina</i>								x						x		x
Ptychopteridae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Blephariceridae					x	x	x	x	x	x	x	x	x	x	x	x
Deuterophlebiidae					x											
Dixidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Meringodixa</i>			x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Dixa</i>	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Culicidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ceratopogonidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>Forcipomyia</i>					x	x	x	x	x	x	x	x	x	x	x	x
<i>Bezzia</i>		x														
Chironomidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Simuliidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Bibionidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Mycetophilidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Sciaridae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Cecidomyiidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Brachycera													x			
Xylomyiidae													x			
Stratiomyidae			x						x	x	x	x	x	x	x	x
Tabanidae	x	x	x						x	x	x	x	x	x	x	x
Rhagionidae	x	x	x						x				x			
Therevidae			x						x				x			
Periscelididae			x						x				x			
Asilidae	x	x	x						x				x			
Acroceridae		x							x				x			
Bombyliidae			x						x							
Empididae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Dolichopodidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Cyclorrhapha											x					
Lonchopteridae		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Phoridae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Pipunculidae		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Syrphidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Conopidae								x								

Table continued on next page.

Taxa	Coastal				Cascade				Central				Eastern			
	Winter	Spring	Summer	Fall												
Sepsidae						x			x	x	x	x				
Sciomyzidae			x			x							x			
Lauxaniidae	x		x		x	x							x		x	
Lonchaeidae	x		x		x				x				x		x	
Sphaeroceridae	x	x	x	x		x	x		x	x	x	x	x	x	x	x
Milichiidae		x				x							x		x	x
Tephritidae	x					x	x									
Ephydriidae	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Drosophilidae	x	x	x	x		x	x	x		x	x	x		x	x	x
Chloropidae	x	x	x			x	x			x	x	x		x	x	x
Agromyzidae	x	x	x				x			x	x			x	x	x
Clusiidae	x	x	x					x						x		
Heleomyzidae		x				x					x			x	x	x
Anthomyzidae		x								x				x		
Anthomyiidae (Scatophagidae)	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x
Muscoidea	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Muscidae	x	x	x	x		x	x	x		x	x	x		x	x	x
Oestroidea										x						
Calliphoridae		x				x	x			x	x	x		x	x	x
Sarcophagidae	x	x					x			x	x	x		x	x	x
Tachinidae	x	x	x			x	x	x	x	x	x	x		x	x	x
Siphonaptera							x									
Hymenoptera	x	x	x			x	x		x	x	x	x	x	x	x	x
Syphyla										x						
Cimbicidae		x														
Tenthredinidae		x														
Apocrita																
Braconidae		x	x				x	x		x	x	x		x	x	x
Ichneumonidae	x	x	x			x	x	x		x	x	x		x	x	x
Chalcidoidea	x	x	x			x	x	x		x	x	x		x	x	x
Mymaridae							x			x	x	x		x	x	x
Eulophidae	x															
Pteromalidae										x	x	x				
Cynipoidea			x							x	x	x	x	x	x	x
Cynipidae	x		x				x	x				x		x	x	x
Evaniidae										x						
Proctotrupoidea	x	x	x			x	x	x		x	x	x		x	x	x
Proctotrupidae	x								x	x	x	x				
Diapriidae		x					x	x		x	x	x		x		x
Platygasteridae		x								x	x	x				x
Bethyloidea		x														
Dryinidae										x						
Formicidae	x	x	x	x		x	x	x		x	x	x	x	x	x	x
Vespoidea									x	x			x			
Vespidae									x	x				x		
Pompilidae											x					
Sphecidae			x				x	x		x	x	x		x	x	x
Apoidea	x	x					x	x		x	x			x	x	x
Halictidae											x		x	x	x	x
Apidae	x							x		x	x	x		x	x	x
Chilopoda	x	x	x													

Table continued on next page.

Taxa	Coastal				Cascade			Central			Eastern				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer
Diplopoda	x	x		x											x
Chordata															
Amphibia															
Salientia	x		x				x								
Ascaphidae															
<i>Ascaphus</i>															
<i>A. truei</i>				x			x	x	x	x	x				
Agnatha															
Petromyzontiformes															
Petromyzontidae															
<i>Lampetra</i>			x	x											
<i>L. tridentata</i>			x												
<i>L. richardsoni</i>			x												
Osteichthyes			x				x				x			x	
Salmoniformes															
Salmonidae	x	x							x		x				
<i>Salmo</i>											x	x			
<i>S. gairdneri</i>															
Cypriniformes															
Catostomidae													x	x	
<i>Catostomus</i>													x	x	
<i>C. macrocheilus</i>															
Cyprinidae															
<i>Rhinichthys</i>															
<i>R. osculus</i>														x	
Cottidae		x	x	x											
<i>Cottus</i>													x		
<i>C. confusus</i>		x											x	x	x
<i>C. perplexus</i>				x											x
<i>C. gulosus</i>	x	x	x	x											
Mammalia															
Rodentia															
Zapodidae															
<i>Zapus</i>															
<i>Z. princeps</i>												x			

## Appendix 2

### Percentage of Samples From Coastal Streams Containing Listed Taxa, by Season and Sample Type

Organisms were tabulated at the family level where possible. Percentages at broader taxonomic levels do not include the individuals identified to the family level.

Taxa	Benthic				Drift				Sticky				Water				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
Number of samples	24	31	43	47	11	15	30	19	16	15	24	23	2	9	14	17	
<i>Percent</i>																	
Platyhelminthes																	
Turbellaria																	
Tricladida																	
Planariidae	4.2																
Nematoda	4.2				7.0		2.1										21.4
Annelida																	
Oligochaeta	25.0	29.0	18.6	51.1		18.2	13.3	3.2	5.0								
Hirudinea	4.2		2.3	4.3													
Mollusca																	
Gastropoda					3.2	4.7			18.2	6.7	19.4	20.0					
Basommatophora																	
Lymnaeidae																	
Planorbidae																	
Stylommatophora	4.2																
Mesogastropoda																	
Pleuroceridae	25.0	64.5	88.4	76.6		27.3	40.0	83.9	65.0								7.1
Hydrobiidae	8.3	54.8	58.1	68.1		18.2	40.0	54.8	55.0								
Pelecypoda																	
Sphaeriidae																	
Sphaeriidae																	
Arthropoda																	
Crustacea																	
Decapoda																	
Astacidae					3.2	20.9	14.9										
Isopoda									6.7		3.2	5.0					
Copepoda									2.1								
Arachnida																	
Araneae																	
Acarina																	
Opiliones																	
Insecta																	
Thysanura																	
Machilidae																	
Collembola																	
Sminthuridae																	
Poduridae																	
Isotomidae																	
Ephemeroptera																	
Siphlonuridae																	
Baetidae																	
Heptageniidae																	
Leptophlebiidae																	
Ephemerellidae																	
Odonata																	
Anisoptera																	
Gomphidae																	
Coenagrionidae																	
Orthoptera																	
Gryllidae																	
Grylacrididae																	
Dermoptera																	

Table continued on next page.

Taxa	Benthic				Drift				Sticky				Water				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
<i>Percent</i>																	
Plecoptera	9.7	11.6	4.3		13.3	22.6	35.0		25.0	33.3	12.5	26.1				5.9	
Pteronarcidae					6.7	19.4		5.0								11.8	
Peltoperlidae		2.3	2.1														
Taeniopterygidae	37.5	4.7	6.4	9.1	6.7												
Nemouridae	29.2	25.8	32.6	21.3	27.3	66.7	38.7	50.0	31.3	53.3	12.5	30.4	57.1	33.3	21.4		
Leuctridae	12.5	6.5	16.3	4.3		20.0	6.5	30.0					4.3	14.3	11.1	23.5	
Capniidae	37.5	19.4	11.6	29.8	18.2		6.5	75.0									
Perlidae	16.7	54.8	83.7	72.3		6.7	25.8	5.0								7.1	
Perlodidae	50.0	64.5	41.9	40.4	9.1	33.3	29.0	25.0								7.1	
Chloroperlidae	54.2	100.0	97.7	93.6	18.2	33.3	38.7	50.0		13.3	16.7			22.2	35.7		
Psocoptera			2.3				6.5	5.0							28.6	41.2	
Mallophaga															7.1		
Thysanoptera															33.3	14.3	
Hemiptera			2.3			6.7	12.9	20.0		6.7	4.2	13.0		11.1	42.9	5.9	
Macroveliidae					2.1		6.7	6.5	10.0				20.0	16.7	13.0		
Gerridae							3.2	5.0		20.0	4.2	21.7		28.6	77.8	52.9	
Veliidae									13.3				33.3	7.1	11.8		
Mesovelidiidae									13.3								
Saldidae									13.3							57.1	
Miridae			2.1												11.1	14.3	
Tingidae						13.3									11.1	7.1	
Aradidae						3.2										5.9	
Lygaeidae						13.3	3.2										
Pentatomidae							3.2										
Homoptera								9.7	10.0		6.7	8.3	8.7	14.3	35.7	23.5	
Cicadellidae		4.7	4.3	9.1				15.0	6.3	20.0	37.5	26.1	14.3		78.6	29.4	
Cercopidae		2.3						10.0				13.0			7.1	52.9	
Psyllidae											13.3				28.6	11.8	
Aphididae		2.3				6.7	9.7	45.0		33.3	12.5	34.8	14.3	22.2	78.6	64.7	
Eriosomatidae							3.2										
Coccoidea						6.7										5.9	
Chermidae																5.9	
Coleoptera	4.2	3.2	4.7	2.1	9.1	13.3	6.5	5.0	12.5	53.3	37.5	13.0		11.1	57.1	5.9	
Lathridiidae									6.7							11.8	
Carabidae															11.1	7.1	
Amphizooidae							3.2	10.0									
Dytiscidae		30.2	12.8	9.1	33.3	16.1				6.7	4.2	4.3				7.1	
Melyndae																	
Gyrinidae																	
Histeridae																	
Hydrophilidae		4.7				13.3	6.5	20.0		13.3	16.7	4.3			22.2	42.9	5.9
Hydraenidae (Limnebiidae)															22.2	7.1	
Ptiliidae				2.1							13.3	4.2	4.3		11.1	28.6	11.8
Chrysomelidae							22.6			33.3	20.8			28.6	33.3	57.1	
Staphylinidae						26.7	9.7	10.0	31.3	60.0	54.2	13.0	28.6	88.9	85.7	29.4	
Colydiidae							3.2	5.0									
Cantharidae						6.7											
Curculionidae (Nemonychidae)											6.7		4.3			7.1	
Elateridae								3.2			4.3				14.3		
Byrrhidae									6.3			8.7				11.8	
Dascillidae																	
Elmidae	50.0	96.8	100.0	100.0	27.3	53.3	67.7	75.0			16.7				11.1	35.7	17.6
Scolytidae											6.7				11.1	28.6	
Cryptophagidae															11.1		
Nitidulidae															11.1		
Endomychidae		6.5													11.1	7.1	
	4.2																

Table continued on next page.

Taxa	Benthic				Drift				Sticky				Water					
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall		
<i>Percent</i>																		
Coccinellidae																		
Cerambycidae																		
Anthicidae																		
Neuroptera																		
Sialidae					4.7	10.6												
Corydalidae																		
Hemerobiidae																		
Trichoptera	4.2	12.9	4.7	6.4			26.7	16.1	10.0	43.8	93.3	75.0	82.6		22.2	7.1		
Limnephilidae	66.7	87.1	83.7	57.4	81.8	73.3	35.5	75.0	6.3	20.0			8.7	14.3	55.6	21.4	29.4	
Philopotamidae			32.6			13.3	29.0						8.7	28.6	11.1	35.7	35.3	
Rhyacophilidae	58.3	71.0	72.1	68.1	9.1	40.0	22.6	35.0		26.7				77.8	28.6	29.4		
Hydropsychidae	12.5	58.1	11.6	40.4		20.0	6.5	35.0						22.2	14.3			
Psychomyiidae		29.0		29.8		6.7	3.2								28.6			
Polycentropodidae			2.3												7.1			
Brachycentridae						9.1	53.3	6.5	30.0		6.7							
Calamoceratidae		20.8	3.2						5.0									
Lepidostomatidae	4.2	6.5	4.7	36.2	18.2	33.3	22.6	70.0		6.7			4.3		55.6	14.3	11.8	
Glossosomatidae	33.3	41.9	44.2	44.7	18.2	6.7	6.5	25.0						22.2	7.1	17.6		
Phryganeidae						2.1									7.1			
Hydroptilidae						4.3								14.3	42.9			
Lepidoptera						2.1								11.1	21.4	11.8		
Lycaenidae																		
Satyridae																		
Hesperiidae																		
Geometridae																		
Microlepidoptera																		
Pyralidae																5.9		
Diptera																14.3	52.9	
Nematocera																		
Tanyderidae																		
Tipulidae	79.2	90.3	97.7	95.7	18.2	40.0	16.1	5.0	31.3	100.0	62.5	60.9		57.1	77.8	100.0	70.6	
Psychodidae	29.2	3.2	14.0	76.6	36.4	20.0	6.5	35.0	6.3	33.3	4.2		42.9	77.8	50.0	35.3		
Ptychopteridae	8.3	3.2		10.6														
Dixidae			4.7			9.1	6.7	22.6	65.0	31.3	40.0	4.2	8.7	28.6	44.4	57.1	64.7	
Culicidae											13.3		4.3				5.9	
Ceratopogonidae	8.3	12.9	7.0	29.8	9.1						26.7	8.3	34.8			100.0	11.8	
Chironomidae	75.0	90.3	86.0	83.0	63.6	73.3	90.3	95.0	87.5	100.0	83.3	87.0		100.0	100.0	88.2		
Simuliidae	41.7	16.1	9.3	10.6	36.4	80.0	48.4	40.0	12.5	6.7	20.8	4.3	14.3	44.4	42.9	17.6		
Bibionidae						6.7					13.3				11.1			
Mycetophiliidae											56.3	73.3	45.8	52.2	28.6	88.9	64.3	58.8
Sciariidae			4.7			33.3	25.8	15.0	31.3	73.3	66.7	56.5		28.6	88.9	92.9	76.5	
Cedidomyiidae						6.7					26.7	16.7	21.7		44.4	100.0	47.1	
Brachycera																	5.9	
Stratiomyidae																		
Tabanidae	4.2		2.3													7.1		
Rhagionidae																	35.7	
Therevidae																		
Asilidae																		
Empididae	12.5	25.8	20.9	25.5		6.7	32.3	5.0	56.3	86.7	100.0	82.6		14.3	88.9	100.0	64.7	
Dolichopodidae							6.5	5.0	56.3	93.3	95.8	100.0		57.1	55.6	100.0	52.9	
Acroceridae																7.1		
Cyclorrhapha																		
Lonchopteridae						6.5	5.0	18.8	33.3	25.0	17.4	28.6		77.8	57.1	41.2	28.6	
Phoridae																		

Table continued on next page.

Taxa	Benthic				Drift				Sticky				Water				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
<i>Percent</i>																	
Pipunculidae							3.2										5.9
Syrphidae									40.0	12.5							7.1
Lauxaniidae																	7.1
Lonchaeidae								6.7									7.1
Sphaeroceridae									13.3	12.5							11.8
Milichiidae																	11.8
Tephritidae																	7.1
Ephydriidae							26.7										35.3
Drosophilidae									6.3	20.0	20.8	39.1	14.3	55.6	100.0		
Chloropidae	3.2									46.7	13.0			22.2	28.6		
Agromyzidae										6.7	4.3						7.1
Clusiidae										13.3	4.3						7.1
Sciomyzidae																	5.9
Heleomyzidae							3.2										
Anthomyzidae																	7.1
Anthomyiidae																	
(Scatophagidae)	3.2						3.2										29.4
Platypezidae									31.3	13.3							
Muscoidea									37.5	33.3	87.5	56.5					5.9
Muscidae										6.7							17.6
Oestroidea																	
Calliphoridae																	21.4
Sarcophagidae																	21.4
Tachinidae																	21.4
Hymenoptera						6.7	3.2										5.9
Sympyta																	
Cimbicidae							3.2										
Tenthredinidae							3.2										7.1
Apocrita																	
Braconidae							3.2	5.0									
Ichneumonidae							3.2										
Chalcidoidea						6.7		5.0									
Eulophidae																	
Cynipoidea																	
Cynipidae																	
Proctotruopoidea			2.1			6.7	3.2	5.0									
Proctotrupidae																	
Diapriidae																	
Platygasteridae																	
Bethyloidea																	
Formicidae																	
Vespoidea																	
Sphecidae					2.1												
Apoidea																	
Apidae																	
Chilopoda																	
Diplopoda																	
Chordata																	
Amphibia																	
Salientia	4.2		2.3														
Asaphidae		3.2															
Agnatha																	
Petromyzontiformes																	
Petromyzontidae								2.1									
Osteichthyes																	
Salmoniformes																	
Salmonidae																	
Cypriniformes																	
Cottidae	12.5	19.4	27.9	25.5		9.1		6.7	35.5	20.0							

Table continued on next page.

## Percentage of Samples From Cascade Streams Containing Listed Taxa, by Season and Sample Type

Taxa	Benthic				Drift				Sticky				Water				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
<i>Percent</i>																	
Platyhelminthes																	
Turbellaria																	
Tricladida																	
Planariidae	25.0	51.7	45.7	39.6		13.3	17.9	4.8								6.3	
Nematomorpha							3.6										
Nematoda	6.3	3.4	2.9	31.3			3.6									12.5	
Annelida																	
Oligochaeta	50.0	75.9	37.1	54.2	58.3	33.3	17.9	4.8								6.7	
Mollusca							8.3										
Gastropoda																	
Arthropoda																	
Crustacea																	
Amphipoda																	
Ostracoda	6.3				10.4												
Arachnida																	
Araneae						4.2	8.3	6.7	17.9								
Acarina						8.3	33.3	25.0	14.3								
Opiiones																	
Insecta																	
Thysanura																	
Machilidae																9.1	
Collembola	6.3				12.5	8.3	20.0			23.8	87.5	87.5	8.3	72.7	53.3	87.5	63.6
Sminthuridae																9.1	
Poduridae										3.6							
Isotomidae	12.5					33.3	26.7	7.1	28.6								
Ephemeroptera	18.8	24.1	25.7	4.2		25.0	40.0	67.9	38.1								
Siphlonuridae	37.5	48.3	68.6	87.5		75.0	86.7	60.7	42.9								
Baetidae	87.5	96.6	97.1	79.2		100.0	100.0	96.4	85.7								
Heptageniidae	100.0	100.0	100.0	87.5		100.0	100.0	78.6	71.4								
Leptophlebiidae	56.3	82.8	71.4	87.5		66.7	80.0	57.1	33.3							6.3	
Ephemerellidae	100.0	96.6	97.1	87.5		100.0	100.0	85.7	61.9							6.7	
Odonata																	
Anisoptera																	
Orthoptera																	
Gryllacrididae																	
Acrididae																	
Plecoptera	37.5	44.8	28.6	31.3		50.0	20.0	21.4	28.6								
Pteronarcidae		6.9	11.4	2.1					4.8								
Peltoperlidae	75.0	82.8	77.1	64.6		75.0	80.0	39.3	57.1							25.0	
Taeniopterygidae	62.5	72.4	5.7	6.3		100.0	80.0										
Nemouridae	43.8	79.3	51.4	85.4		100.0	86.7	50.0	85.7	25.0	75.0	50.0	13.6				
Leuctridae	25.0	37.9	34.3	27.1		83.3	86.7	10.7	14.3								
Capniidae	87.5	34.5	14.3	25.0		91.7	46.7	10.7	38.1								
Perlidae	81.3	79.3	88.6	91.7		25.0	13.3	32.1	14.3								
Periodidae	37.5	48.3	80.0	58.3		33.3	26.7	42.9	47.6								
Chloroperlidae	81.3	96.6	82.9	95.8		83.3	73.3	28.6	42.9								
Psocoptera								3.6	23.8								
Mallophaga																	
Thysanoptera																	
Hemiptera																	
Gerridae																	
Coreidae																	
Saldidae																	
Miridae																	
Nabidae																	
Tingidae																	
								3.6									

Table continued on next page.

Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Percent																
Lygaeidae	7.1															
Homoptera		2.9														
Cicadellidae		2.9														
Cercopidae																
Delphacidae																
Achilidae																
Psyllidae																
Aphididae																
Coleoptera																
Lathridiidae																
Noteridae																
Carabidae																
Amphizoidae																
Dytiscidae																
Melyridae																
Histeridae																
Hydrophilidae	6.3		5.7			25.0	20.0	53.6	23.8							
Hydraenidae						16.7	20.0	7.1	28.6							
(Limnebiidae)																
Melandryidae																
Scarabaeidae																
Cicindelidae																
Ptiliidae																
Chrysomelidae																
Staphylinidae		2.9				8.3	33.3	14.3	33.3							
Pselaphidae								25.0								
Meloidae								3.6								
Cantharidae																
Lampyridae																
Curculionidae																
(Nemonychidae)																
Cleridae																
Elateridae																
Eucnemidae																
Buprestidae																
Dascillidae																
Ptilodactylidae																
Helodidae																
Limnichidae																
Psephenidae																
Elmidae	25.0	58.6	77.1	85.4	58.3	60.0	60.7	52.4		6.3	12.5		6.7			
Scolytidae							3.6									
Derodontidae							3.6									
Cryptophagidae								4.8								
Bostrichidae																
Nitidilidae																
Cucujidae																
Endomychidae																
Coccinellidae																
Cerambycidae																
Anthicidae																
Mordellidae																
Tenebrionidae																
Neuroptera			3.4			2.1										
Sialidae	6.3		25.0	20.7	42.9	2.1	31.3	16.7		4.8		4.2				18.8
Corydalidae									3.6							

Table continued on next page.

Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<i>Percent</i>																
Hemerobiidae																
Chrysopidae																
Trichoptera	6.3	10.3	22.9	25.0	33.3	20.0	35.7	19.0	12.5	25.0	100.0	54.5	6.7	18.8	9.1	
Limnephilidae	25.0	44.8	22.9	66.7	91.7	73.3	25.0	52.4	6.3	12.5		4.5		62.5	54.5	
Philopotamidae	6.3		17.1	6.3	16.7	26.7	14.3	9.5						87.5	9.1	
Rhyacophilidae	100.0	69.0	80.0	79.2	91.7	86.7	75.0	38.1						93.8	63.6	
Hydropsychidae	43.8	44.8	51.4	31.3	66.7	40.0	32.1	33.3						87.5		
Psychomyiidae	6.3					13.3	7.1									
Polycentropodidae	6.3	10.3	2.9	4.2	8.3	6.7		9.5						6.3		
Brachyceridae	6.3	3.4	2.9	18.8	66.7	66.7	25.0	38.1								
Calamoceratidae					2.1	6.7										
Lepidostomatidae	25.0	27.6	40.0	29.2	75.0	60.0	32.1	4.8						56.3	9.1	
Glossosomatidae	93.8	75.9	2.9	33.3	58.3	46.7	25.0	23.8						68.8		
Phryganeidae			2.9													
Hydroptilidae					8.3		3.6	4.8						31.3		
Lepidoptera						6.7	10.7	4.8						25.0		
Pieridae														6.3		
Lycenidae														12.5		
Hesperiidae														6.3		
Geometridae						3.6								18.8	9.1	
Microlepidoptera						14.3								43.8		
Pyralidae						7.1										
Aegeridae (Sesiidae)																
Diptera	3.4	8.6			13.3	17.9	9.5	12.5	12.5	4.2	9.1		13.3	12.5	27.3	
Nematocera						50.0								12.5	18.2	
Tanyderidae																
Tipulidae	68.8	89.7	82.9	91.7	91.7	66.7	64.3	42.9	12.5	25.0	83.3	54.5	80.0	93.8	36.4	
Psychodidae	12.5			2.1	25.0	13.3	7.1	14.3	6.3	12.5	4.5		20.0	81.3	36.4	
Blephariceridae	6.3	3.4			66.7	60.0	7.1			45.8			6.7	43.8		
Deuterophlebiidae					13.3											
Dixidae			5.7		8.3	20.0	25.0	28.6	12.5					6.7	62.5	63.6
Culicidae														6.3		
Ceratopogonidae		17.2	20.0	25.0	25.0		25.0	14.3			4.2	9.1		100.0		
Chironomidae	68.8	86.2	100.0	97.9	91.7	100.0	89.3	90.5	50.0	68.8	100.0	68.2	100.0	100.0	90.9	
Simuliidae	18.8	37.9	20.0	2.1	100.0	93.3	57.1	19.0	12.5	12.5	12.5		13.3	31.3		
Bibionidae					6.7											
Mycetophilidae					8.3	46.7	25.0	28.6	37.5	43.8	83.3	95.5	60.0	87.5	90.9	
Sciariidae			5.7			26.7	57.1	28.6	18.8	18.8	79.2	54.5	13.3	100.0	63.6	
Cedidomyiidae											4.2	4.5		100.0	54.5	
Brachycera																
Stratiomyidae								4.8						6.3		
Tabanidae			2.9					3.6						12.5		
Rhagionidae														6.3		
Periscelididae														50.0	50.0	
Asilidae															31.3	
Acroceridae															12.5	
Bombyliidae																
Empididae	6.3	34.5	54.3	31.3	25.0	33.3	75.0	19.0	75.0	87.5	95.8	100.0	86.7	100.0	81.8	
Dolichopodidae			2.9			13.3	7.1		12.5	6.3	100.0	36.4	6.7	75.0	27.3	
Cyclorrhapha														43.8		
Lonchopteridae					8.3	6.7	21.4	14.3	50.0		8.3	4.5		33.3	87.5	54.5
Phoridae												4.2				
Platypezidae																
Pipunculidae																

Table continued on next page.

Taxa	Benthic				Drift				Sticky				Water					
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall		
<i>Percent</i>																		
Syrphidae			2.9					4.8				33.3				25.0		
Conopidae															6.3			
Sepsidae															25.0			
Lauxaniidae															6.7	31.3		
Lonchaeidae															6.7			
Sphaeroceridae							3.6								75.0	18.2		
Milichiidae															56.3			
Tephritidae															6.3	9.1		
Ephydriidae					8.3	13.3	14.3	4.8				6.3	33.3	4.5		100.0	27.3	
Drosophilidae						6.7	3.6								18.8	9.1		
Chloropidae						6.7									6.3			
Agromyzidae															12.5			
Sciomyzidae							3.6											
Heleomyzidae															6.7			
Anthomyzidae							3.6								68.8	45.5		
Anthomyiidae																		
(Scatophagidae)															25.0			
Muscoidea															6.3			
Muscidae															56.3	18.2		
Oestroidea																		
Calliphoridae															25.0			
Sarcophagidae															56.3	27.3		
Tachinidae							3.6								6.3			
Siphonaptera																		
Hymenoptera																		
Apocrita																		
Braconidae																		
Ichneumonidae							17.9	4.8										
Chalcidoidea							14.3	4.8							6.7	43.8	18.2	
Mymanidae							6.7	25.0	9.5						75.0	36.4	9.1	
Cynipoidea																		
Cynipidae																		
Prototropoidea								10.7	4.8									
Diapriidae								14.3	9.5						13.3	50.0	27.3	
Bethyloidea								3.6	4.8									
Formicidae															62.5	9.1		
Vespoidea																		
Vespidae															6.3	9.1		
Sphecidae															25.0	27.3		
Apoidea																31.3	9.1	
Apidae																9.1		
Chordata																		
Amphibia																		
Salientia																		
Ascaphidae		3.4	2.9												6.7	18.8		
Osteichthyes																		
Salmoniformes																		
Salmonidae							2.1											

Table continued on next page.

## Percentage of Samples From Central Streams Containing Listed Taxa, by Season and Sample Type

Taxa	Benthic				Drift				Sticky				Water				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
<i>Percent</i>																	
Platyhelminthes																	
Turbellaria																	
Tricladida																	
Planariidae	31.3	26.7	35.4	44.4	12.5	26.7	4.3	12.0									
Nematoda		6.7	10.4	11.1													9.1
Annelida																	
Oligochaeta	56.3	60.0	50.0	75.6	12.5	26.7	4.3	20.0									9.1
Mollusca																	
Gastropoda																	
Basommatophora																	
Physidae					6.7												
Planorbidae					2.2												
Mesogastropoda																	
Hydrobiidae					4.2	2.2			6.7	4.3							
Pelecypoda																	
Sphaeriidae	6.3				4.4												
Arthropoda																	
Crustacea																	
Amphipoda		3.3	4.2	2.2													
Ostracoda					2.2												
Copepoda					2.2												
Arachnida																	
Araneae					2.1	4.4											
Acarina	6.3		14.6	6.7													
Pseudoscorpionida																	
Opiliones																	
Insecta									6.7								
Thysanura									8.7								
Machilidae									4.3	24.0							
Collembola					2.2				6.7								
Sminthuridae									13.3	8.7	8.0						
Isotomidae									39.1	20.0							
Ephemeroptera					10.4	8.9											
Siphlonuridae	18.8	3.3	52.1	24.4	62.5	60.0	47.8	40.0									26.7
Baetidae	75.0	86.7	93.8	77.8	75.0	100.0	78.3	88.0									60.0
Heptageniidae	87.5	80.0	83.3	91.1	75.0	93.3	56.5	88.0									133
Leptophlebiidae	56.3	36.7	20.8	46.7	50.0	13.3	43.5	52.0									6.7
Ephemerellidae	87.5	83.3	91.7	91.1	75.0	86.7	82.6	84.0									133
Odonata					2.1												
Gomphidae																	
Cordulegastridae	6.3				4.4				6.7								
Libellulidae									8.7								
Orthoptera					2.1				4.3								
Tetrigidae																	
Gryllidae																	
Dermoptera																	
Forficulidae																	6.7
Plecoptera																	6.7
Peltoperlidae	6.3	3.3	16.7	2.2					8.7	8.0							
Taeniopterygidae					2.2				8.0								
Nemouridae	100.0	76.7	31.3	66.7	87.5	93.3	21.7	92.0									40.0
Leuctridae	6.3	10.0		11.1				8.0									27.3
Capniidae	50.0	16.7		53.3	62.5	20.0	8.7	72.0									36.4
Perlidae	75.0	73.3	81.3	82.2				13.0	24.0								
Perlodidae	31.3	6.7	41.7	71.1				13.3	20.0								18.2
Chloroperlidae	81.3	76.7	89.6	91.1	62.5			21.7	60.0								9.1
Psocoptera					2.1	2.2			8.7	12.0							6.7
Thysanoptera									6.7								
Hemiptera					10.4				13.0	12.0							
Corixidae									13.0	8.0							
Neididae									4.3								
Gerridae					2.1				26.1	12.0							
Veliidae									4.3	8.0							
Saldidae									4.3								
Anthocoridae									4.3								
Miridae									8.7								
Nabidae									8.7	4.0							
Reduviidae									8.7								
Tingidae									8.7								
Aradidae									4.3								
Lygaeidae									8.7								
																	27.3

Table continued on next page.

Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<i>Percent</i>																
<b>Homoptera</b>																
Cicadellidae	3.3	27.1	2.1	13.3			8.7	8.0		14.3	27.3	12.5		36.4	36.4	6.7
Cercopidae		6.3					52.2	80.0		28.6	81.8	91.7		45.5	63.6	73.3
Delphacidae							4.3	4.0				4.2		9.1		9.1
Psyllidae	3.3		2.2				26.1	28.0		7.1	9.1	29.2			45.5	53.3
Aphididae		10.4	2.2			6.7	52.2	68.0		28.6	31.8	45.8			72.7	93.3
Eriosomatidae							4.3									33.3
Coccoidea															9.1	
<b>Coleoptera</b>																
Cupedidae															18.2	27.3
Silphidae															18.2	
Lathridiidae																
Carabidae																
Halipidae																
Amphizoidae																
Dytiscidae	12.5	6.7	6.3	20.0			6.7	52.2								
Gyrinidae																
Hydrophilidae	6.3						12.5	6.7	12.0						18.2	18.2
Hydraenidae																
(Limnebiidae)	6.7		2.1												36.4	9.1
Melandryidae															9.1	
Scarabaeidae															9.1	
Ptiliidae															27.3	20.0
Chrysomelidae	3.3		2.1												54.5	33.3
Scaphidiidae															18.2	13.3
Staphylinidae															72.7	46.7
Colydiidae															9.1	
Scydmaenidae															18.2	
Cantharidae															9.1	
Curculionidae															9.1	
(Nemonychidae)															9.1	
Malachiidae															9.1	
Cleridae															9.1	
Elateridae															9.1	
Buprestidae															9.1	
Helodidae															17.4	
Dryopidae															4.0	
Elmidae	87.5	70.0	91.7	93.3		37.5	26.7	65.2	4.3	12.0					18.2	4.2
Scolytidae								4.3		84.2						
Derodontidae															4.5	
Nitidulidae																
Coccinellidae															9.1	27.3
Cerambycidae															18.2	
Pediidae																
Cephaloidea																
Mordellidae																
Tenebrionidae																
<b>Neuroptera</b>																
Sialidae		3.3														
Raphidiidae																
Coniopterygidae																
Hemerobiidae																
<b>Trichoptera</b>	25.0	6.7	37.5	24.4		12.5		30.4	4.3	28.0					21.4	66.7
Limnephilidae	62.5	76.7	85.4	55.6		62.5	80.0	78.3	4.3	76.0					13.6	29.2
Philopotamidae		14.6	2.2													
Rhyacophilidae	56.3	76.7	45.8	71.1		12.5	26.7	13.0	4.3	12.0						
Hydropsychidae	68.8	66.7	50.0	73.3		37.5	13.3	26.1	4.3	40.0						
Psychomyiidae																

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Taxa	Benthic				Drift				Sticky				Water				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
<i>Percent</i>																	
Polycentropodidae				4.4			6.7										
Brachyceridae	43.8	43.3	14.6	42.2	25.0	33.3	26.1	44.0							18.2	6.7	
Lepidostomatidae	56.3	36.7	16.7	51.1	25.0	53.3	43.5	48.0							36.4	6.7	
Glossosomatidae	25.0	3.3	47.9	26.7			17.4	4.0							9.1	20.0	
Phryganeidae																	13.3
Lepidoptera				2.1			6.7	21.7	16.0						27.3	6.7	
Satyridae																	6.7
Hesperiidae																	26.7
Arctiidae																	18.2
Noctuidae															45.5	13.3	
Geometridae															9.1	6.7	
Microlepidoptera																	
Diptera		3.3	12.5	4.4	12.5		43.5	36.0									27.3
Nematocera																	20.0
Tipulidae	93.8	80.0	77.1	80.0	12.5	40.0	43.5	28.0									6.7
Psychodidae	81.3	63.3	4.2	91.1	62.5	20.0	26.1	64.0									26.7
Blephariceridae		10.0				6.7											18.2
Dixidae							34.8	28.0									13.3
Culicidae								4.0									6.7
Ceratopogonidae	25.0	23.3	22.9	51.1			26.1	20.0									33.3
Chironomidae	100.0	96.7	100.0	95.6	100.0	86.7	95.7	92.0									100.0
Simuliidae	18.8	70.0	18.8			37.5	66.7	65.2	16.0								13.3
Bibionidae									24.0								20.0
Mycetophilidae					2.2				26.1	44.0							100.0
Sciariidae									69.6	56.0							9.3
Cedidiomyiidae									34.8	4.0							46.7
Brachycera																	
Xylomyiidae																	
Stratiomyidae	6.3		2.1	2.2													
Tabanidae	12.5	3.3	16.7	17.8		6.7	8.7										27.3
Rhagionidae																	
Therevidae																	6.7
Asilidae																	13.3
Acroceridae																	27.3
Empididae	18.8	16.7	18.8	46.7			43.5	24.0									86.7
Dolichopodidae			2.1	4.4			8.7	16.0									33.3
Cyclorrhapha					2.1												
Lonchopteridae																	6.7
Phoridae									13.0	12.0							40.0
Pipunculidae									4.3								20.0
Syrphidae									8.0								6.7
Sepsidae																	6.7
Lonchaeidae																	9.1
Sphaeroceridae									4.0								6.7
Ephydriidae			4.2				39.1	16.0									73.3

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## Percentage of Samples From Eastern Streams Containing Listed Taxa, by Season and Sample Type

Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<i>Percent</i>																
<b>Platyhelminthes</b>																
Turbellaria																
Tricladida																
Planariidae	6.3	3.1	6.0	12.8												
Nematoda					2.0	14.9										18.2
Annelida																
Oligochaeta	75.0	62.5	22.0	70.2					33.3	4.2	14.3					6.3
Mollusca																
Gastropoda																
Basommatophora																
Physidae	12.5	18.8	12.0	40.4					12.5							
Planorbidae				4.3												
Ancyliidae	18.8	3.1		17.0												
Mesogastropoda																
Pleuroceridae				2.0												
Hydrobiidae	6.3			2.0												
Pelecypoda																
Margaritanidae				2.0												
Sphaeriidae	6.3	18.8		14.9												
Unionidae				2.0												
Arthropoda																
Crustacea																
Decapoda																
Astacidae	6.3		24.0	34.0					6.7	12.5	4.8					
Amphipoda		3.1		4.3												
Ostracoda				2.1												
Copepoda				4.3												
Arachnida																
Araneae				2.0	4.3				6.7	66.7	47.6					
Acarina	6.3		14.0	17.0					6.7	37.5	33.3					
Opiliones																
Insecta				2.0												
Collembola		3.1		2.1	12.5	20.0			38.1				20.0	30.0	27.3	37.5
Sminthuridae							26.7		4.8				10.0			
Isotomidae									60.0				40.0			
Ephemeroptera								42								
Siphlonuridae	37.5	21.9	66.0	55.3	50.0	66.7	41.7	47.6								
Baetidae	31.3	65.6	64.0	48.9	37.5	73.3	62.5	81.0								
Heptageniidae	68.8	81.3	98.0	66.0	37.5	80.0	37.5	47.6								
Leptophlebiidae	75.0	37.5	74.0	83.0	25.0	40.0	37.5	81.0								
Ephemerellidae	68.8	28.1	68.0	80.9	50.0	33.3	66.7	66.7								
Odonata																
Anisoptera																
Gomphidae																
Aeshnidae																
Coenagrionidae																
Orthoptera																
Gryllidae																
Acrididae																
Plecoptera	6.3	6.3	4.0	4.3	12.5	6.7	4.2	9.5					10.0	9.1		
Pteronarcidae	6.3															
Taeniopterygidae		3.1		2.1												
Nemouridae	62.5	78.1	34.0	40.4	50.0	100.0	20.8	52.4					70.0	45.5	6.3	
Leuctridae													30.0			
Capniidae	62.5	53.1	4.0	29.8	75.0	46.7	8.3	4.8					40.0	9.1		
Perlidae	31.3	31.3	46.0	57.4									10.0	9.1		
Perlodidae	56.3	15.6	52.0	66.0	12.5	6.7	4.2	14.3						45.5		
Chloroperlidae	68.8	65.6	60.0	74.5	12.5	26.7	4.2	14.3						54.5	18.8	
Psocoptera																
Thysanoptera																
Hemiptera	6.3															
Corixidae																
Gerridae																
Coreidae																
Saldidae																
Anthocoridae																
Miridae																
Nabidae																
Reduviidae																
Lygaeidae																
			2.0													27.3

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Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<i>Percent</i>																
<b>Homoptera</b>																
Cicadellidae			16.0	25.5												
Cercopidae					12.5	13.3	25.0	61.9								
Delphacidae																
Psyllidae																
Aphididae			2.0				6.7	20.8	71.4							
Eriosomatidae									9.5							
<b>Coleoptera</b>																
Noteridae			2.0													
Carabidae					12.5	13.3	8.3	19.0								
Haliplidae	6.3		10.0	19.1					4.2	9.5						
Dytiscidae	25.0		22.0	27.7	12.5	20.0	12.5	14.3								
Histeridae									4.2							
Hydrophilidae		3.1	2.0		12.5	20.0	16.7	42.9								
Hydraenidae (Limnebiidae)	6.3			2.1	50.0	26.7	12.5	47.6								
Melandryidae									6.7							
Scarabaeidae																
Ptiliidae									4.8							
Chrysomelidae			2.1		12.5	40.0	16.7	57.1								
Staphylinidae																
Scydmaenidae									4.2							
Cantharidae			2.0													
Lampyridae																
Curculionidae (Nemonychidae)									4.8							
Elateridae																
Psephenidae									4.2							
Elmidae	43.8	37.5	98.0	87.2	25.0	6.7	54.2	71.4								
Scolytidae						6.7	4.2	4.8								
Bostriichidae									8.3							
Nitidulidae																
Coccinellidae			2.0						4.2	4.8						
Cerambycidae																
<b>Neuroptera</b>																
Sialidae	12.5	3.1	10.0	55.3	12.5											
Chrysopidae																
<b>Trichoptera</b>																
Limnephilidae	12.5	6.3	2.0	8.5		6.7	12.5	14.3								
Philopotamidae	6.3		20.0	14.9	37.5	40.0	16.7	33.3								
Rhyacophilidae	12.5	43.8	12.0	8.5		26.7										
Hydropsychidae	18.8	12.5	12.0	27.7					4.8							
Psychomyiidae			4.0	17.0					42.9							
Polycentropodidae									4.8							
Lepidostomatidae	50.0	31.3	10.0	48.9	12.5	6.7	38.1									
Glossosomatidae	12.5	6.3	12.0	8.5			4.8									
Hydroptilidae	12.5		4.0	17.0			4.2	4.8								
Leptoceridae																
<b>Lepidoptera</b>																
Satyridae									6.7	4.8						
Hesperiidae																
Noctuidae																
Geometridae																
Microlepidoptera									8.3							
Pyralidae					17.0	6.7			9.5							
<b>Diptera</b>		3.1	2.0			13.3	4.2	23.8								
Nematocera									9.5							
Tipulidae	81.3	81.3	74.0	83.0	12.5	33.3	8.3	57.1		6.7	4.5					
Psychodidae	25.0	25.0	4.0	36.2	12.5	6.7	8.3	38.1		6.7	59.1					
Blephariceridae	18.8					6.7		4.8								
Dixidae						6.7	25.0	71.4								
Ceratopogonidae		9.4	10.0	23.4		13.3		28.6								
Chironomidae	93.8	81.3	88.0	91.5	75.0	86.7	70.8	100.0		73.3	85.7	86.4				
Simuliidae	31.3	65.6	22.0	4.3		80.0	37.5	28.6		6.7	9.5	4.5				
Bibionidae									9.5			4.5				
Mycetophilidae						13.3		19.0		20.0	47.6	68.2				

Table continued on next page.

Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Percent																
Sciaridae	3.1	4.0	4.3		33.3	20.8	52.4	-	13.3	52.4	54.5		100.0	81.3		
Cedidomyiidae					6.7		14.3		6.7	19.0	9.1		100.0	43.8		
Brachycera																6.3
Stratiomyidae	3.1															
Tabanidae	18.8	9.4	8.0	23.4												
Rhagionidae																
Periscelididae																
Asilidae																
Acroceridae																
Bombyliidae																
Empididae	10.0	6.4			16.7	19.0			20.0	61.9	100.0		10.0	72.7	62.5	
Dolichopodidae	2.0				12.5	14.3			95.2	50.0			30.0	100.0	81.3	
Cyclorrhapha																
Lauxaniidae																
Lonchopteridae																
Phoridae																
Syrphidae																
Lonchaeidae																
Sphaeroceridae																
Milichiidae																
Ephydriidae	2.0					20.8	47.6			42.9	22.7		20.0	100.0	81.3	
Drosophilidae										4.8						
Chloropidae																
Agromyzidae																
Clusiidae																
Sciomyzidae																
Heleomyzidae																
Anthomyzidae																
Anthomyidae																
(Scatophagidae)																
Muscoidea																
Muscidae																
Oestroidea																
Calliphoridae																
Sarcophagidae																
Tachinidae																
Hymenoptera																
Apocrita																
Braconidae					2.1											
Ichneumonidae					2.1											
Chalcidoidea																
Mymaridae					2.0											
Cynipoidea						12.5										
Cynipidae																
Proctotrupoidea					2.1											
Diapriidae																
Platygasteridae																
Bethyloidea																
Formicidae																
Vespoidea																
Sphecidae																
Apoidea																
Halictidae																
Apidae																
Diplopoda																
Chordata																
Osteichthyes																
Cypriniformes																
Catostomidae					2.0	4.3										
Cyprinidae						2.1										
Cottidae																
Mammalia					6.3	18.0	12.8									
Rodentia																
Zapodidae																9.1

## Appendix 3

### Summary of Invertebrate Data For Each Season and Sample Type—Coastal Streams

#### 1. Composition

Taxa	Benthic				Drift				Sticky				Water				
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	
Percent																	
Oligochaeta	0.5	0.2	0.2	0.6	0.6	0.1	0.1						1.5	1.5			
Gastropoda	.7	2.3	10.0	5.0	13.0	2.6	15.7	10.1	0.1				2	3.6	3.4		
Araneae					.1	.1	.2	.3	.5	0.6		1.2	1.5	1.9			
Acarina						.2	.4	.2	.1			.1	.5	1.1	.5	.4	
Collembola					.1	.6	.4	.2	3.7	13.5	0.4	3.0	5.0	13.2	1.0	9.7	
Ephemeroptera	65.9	59.3	20.5	17.4	24.5	68.3	41.9	18.5	2.1	1.6	.3	1.9	2.0	1.1	1.0	1.4	
Orthoptera									.6			.1		1.0		.1	
Plecoptera	8.4	11.8	19.8	11.5	6.5	12.4	10.3	27.3	10.3	3.9	.2	2.1	6.5	1.2	.6	.5	
Psocoptera									.2					2		1.9	
Hemiptera						.3	.6	.4		1.3	.7	1.0	3.0	3.4	4.1	1.7	
Homoptera					.1	.3	.1	.7	.2	1.4	.4	2.0	1.5	1	5.7	4.8	
Coleoptera	1.9	13.6	27.3	32.3		4.7	3.1	6.8	2.8	3.3	10.0	3.9	.9	3.5	3.4	6.1	1.6
Trichoptera	7.0	5.7	10.2	10.3	23.9	5.5	6.0	24.4	2.8	5.4	9	9.4	2.5	4.5	2.6	3.0	
Diptera	15.4	7.0	11.1	21.9	24.8	6.7	16.1	14.3	76.8	60.3	92.9	75.6	72.0	64.5	72.6	68.2	
Hymenoptera						.6	.2	.3	.4	.2	1.3	.2	1.8		1.9	1.4	2.9
Other 1/	.2	.1	.7	.8	.5		.9	.4			.1	.9	.5	1.2	.6	.4	

1/ Other is the sum of all taxa that did not comprise more than 1 percent of the total number of organisms within that season

#### 2. Number of organisms and sample weights

Parameter	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Number of samples	24	31	43	47	11	15	30	19	16	15	24	23	2	9	14	17
Mean number of organisms per sample	76.0	193.1	145.6	163.0	29.3	192.9	95.3	117.8	26.7	130.3	428.5	66.2	28.6	169.8	238.4	81.6
Minimum number of organisms per sample	1	11	42	25	1	8	7	11	6	34	52	16	4	52	161	2
Maximum number of organisms per sample	251	538	479	472	99	1689	391	283	49	406	1694	145	72			
Mean sample weight(g)	.050	.274	.498	.210	.103	.233	.501	.263					.025	.206	.136	.079
Minimum sample weight(g)	.002	.003	.035	.021	.002	.003	.015	.028					.000	.023	.067	.001
Maximum sample weight(g)	.270	1.064	1.811	.812	.601	.962	1.923	1.223					.087	.417	.264	.362

## Summary of Invertebrate Data for Each Season and Sample Type—Cascade Streams

### 1. Composition

Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<i>Percent</i>																
Nematoda	0.1	0.2	0.2	1.7												0.1
Oligochaeta	.8	3.3	1.9	2.9	1.1	0.1	0.7	0.1								.1
Araneae					.1		.2									1.2
Acarina						1	1.9	.2								.1
Collembola	.2				.3	.3	.1	6.7								
Ephemeroptera	50.1	60.5	47.2	25.5	34.7	62.5	45.0	22.7	91.2	43.9	9.5	59.7	25.5	23.9	33.0	
Plecoptera	33.5	19.6	17.7	28.4	30.9	10.0	4.3	23.9		.6	7.5	1.1	.2	13.4	1.2	1.1
Psocoptera								2.0								.3
Thysanoptera																1.4
Hemiptera								.2				.6				.3
Homoptera								1.2				.3				2.1
Coleoptera	.4	.6	3.4	3.4	.9	.5	4.8	4.5		.1	1.0	1.5				3.7
Neuroptera	.3	.1	.4	.4	.1			.1								1.1
Trichoptera	8.4	3.7	5.7	8.6	18.6	4.1	4.8	5.4		.2	.7	5.5	1.3			.1
Diptera	4.5	11.4	22.3	26.8	12.9	22.0	35.4	30.9	7.9	46.4	78.9	35.0		57.4	57.1	53.3
Hymenoptera							1.1	1.6			.4	.5				1.1
Other <sup>1</sup>	1.7	.6	1.1	1.8	.4	.4	.3	5			.5	1.7				.2
																.4
																.5

<sup>1</sup>/ Other is the sum of all taxa that did not comprise more than 1 percent of the total number of organisms within that season.

### 2. Number of organisms and sample weights

Parameter	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Number of samples	16	29	35	48	12	13	26	21	8	16	24	22	15	16	11	
Mean number of organisms per sample	124.3	227.6	144.2	132.2	177.0	576.5	170.4	85.1	77.4	46.4	331.8	129.6	54.7	594.8	131.7	
Minimum number of organisms per sample	28	41	30	19	75	75	1	10	4	5	66	13	4	22	45	
Maximum number of organisms per sample	238	657	348	396	318	1445	535	251	424	305	2725	617	130	3182	329	
Mean sample weight(g)	.058	.171	.141	.068	.063	.240	.090	.057						.166	.673	.093
Minimum sample weight(g)	.004	.040	.021	.005	.012	.041	.001	.004						.001	.091	.001
Maximum sample weight(g)	.210	.537	587	.318	.147	.575	.404	.639						1.180	2.788	.279

## Summary of Invertebrate Data for Each Season and Sample Type—Central Streams

### 1. Composition

Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<i>Percent</i>																
Trichadida	0.3	0.1	3.3	2.0	0.1	0.1		0.1						0.2	2.9	1.1
Oligochaeta	1.0	1.7	1.6	1.3	.3	.2		.1						95.5	.9	16.7
Araneae					.1	0.4	.2							.1	.4	1.1
Collembola					.1	.1	.2							.1	.4	.6
Ephemeroptera	31.7	23.0	33.5	34.3	33.6	31.8	39.6	31.7						.5	.6	1.1
Plecoptera	28.1	20.4	11.1	11.9	31.0	37.6	.9	12.3						.2	.8	.6
Thysanoptera															3.8	.2
Hemiptera					.1	.1	1.0	.2						.3	1.3	.3
Homoptera					.7	.1	8.8	8.5						.8	12.7	5.0
Coleoptera	4.3	2.7	12.9	9.6	.4	.3	12.5	14.7						.2	13.2	1.4
Trichoptera	6.9	10.4	16.7	9.3	1.6	3.9	3.2	7.0						.2	5.4	10.6
Diptera	27.6	41.5	19.7	31.1	32.9	25.8	26.3	23.0						7.7	46.9	29.1
Hymenoptera							6.5	1.5						.2	.6	.6
Other <sup>1</sup>	.1	.2	.5	.4		.1	.7	.5						.1	.1	.4

<sup>1</sup>/ Other is the sum of all taxa that did not comprise more than 1 percent of the total number of organisms within that season.

### 2. Number of organisms and sample weights

Parameter	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Number of samples	16	30	48	45	8	14	21	21	14	22	24	21	11	11	15	
Mean number of organisms per sample	284.3	330.5	153.0	302.1	235.9	237.5	243.2	340.8	380.7	930.7	221.5		892.5	376.9	222.9	
Minimum number of organisms per sample	39	3	23	1	29	10	8	10	21	43	38	5	5	56		
Maximum number of organisms per sample	909	1054	628	765	773	888	1224	1606	2033	11063	2378		5654	1681	459	
Mean sample weight(g)	.101	.200	.160	.138	.093	.081	.096	.085					.095	.401	.162	
Minimum sample weight(g)	.003	.001	.005	.000	.016	.004	.003	.001					.038	.226	.024	
Maximum sample weight(g)	.218	.503	1.348	.653	.216	.180	.581	.655					.132	.732	.451	

## Summary of Invertebrate Data for Each Season and Sample Type—Eastern Streams

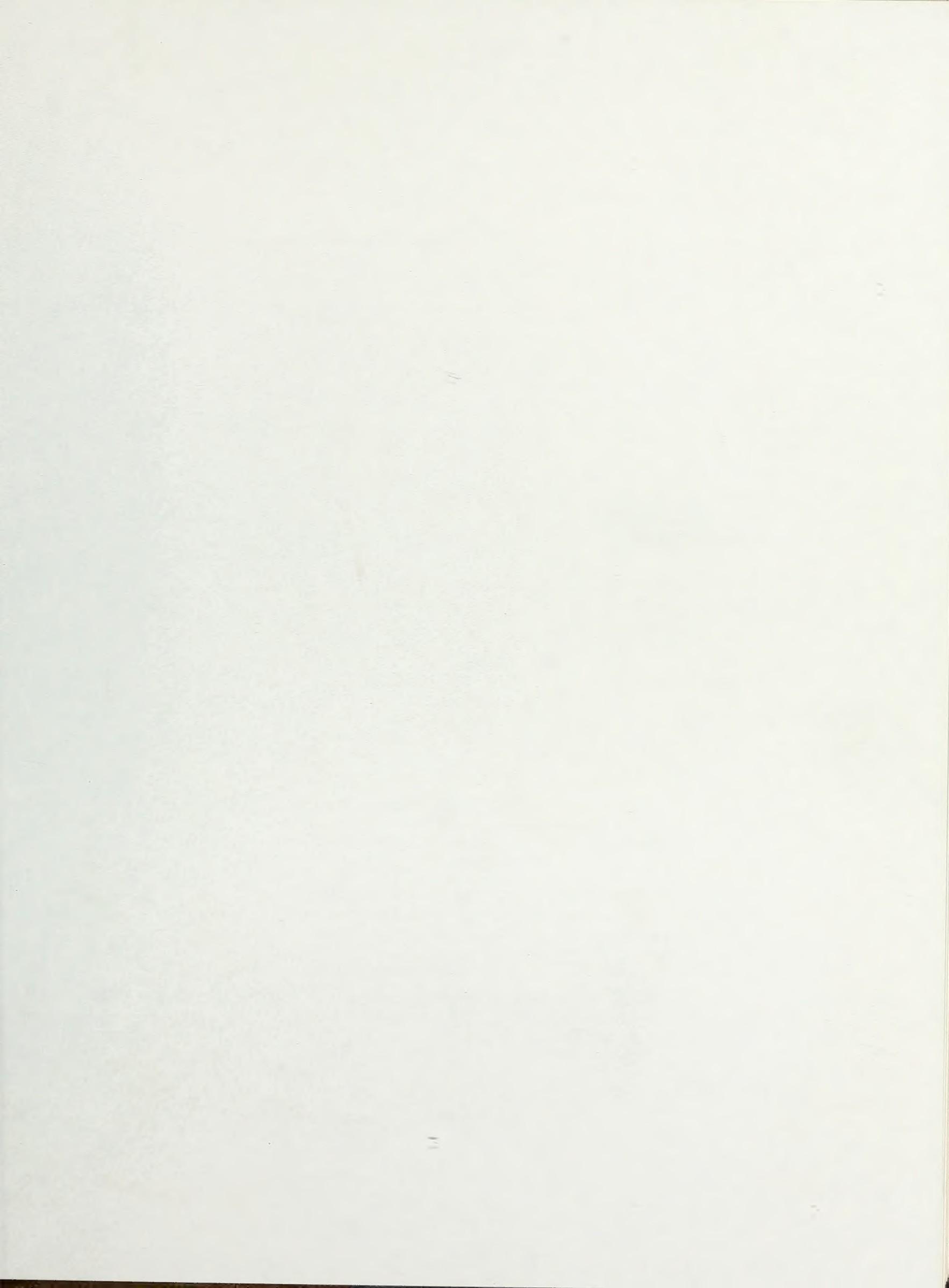
### 1. Composition

Taxa	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
<i>Percent</i>																
Oligochaeta	2.3	3.6	0.3	4.0	0.2	0.4	0.4						0.6	2.6	3.3	
Gastropoda	.9	.2	.4	4.4	1.8		.3	0.1					.6	.4	.2	
Decapoda	1.0		.4	.5			.3	.1					33.6	.1	7.1	
Araneae							1.6	.4	0.8	1.1	1.8					
Acarina	.1		.2	.1			1.7	1.4	.2							
Collembola					.6	.4		1.0	53.5							
Ephemeroptera	31.1	9.8	41.4	30.6	33.2	5.4	18.8	11.7		7.1	2.5		.6	2.0	1.8	
Plecoptera	20.9	31.7	6.9	9.3	41.0	76.0	2.4	1.6	15.3	6.0			40.3	3.2		
Hemiptera	.1		.2	1.1	2.7		4.3	.3					.9	1.2	.6	
Homoptera			.3	.8	.3	.1	2.4	52.8	1.2	8.5	36.7		3.5	6.2	7.1	
Coleoptera	8.1	1.6	17.5	8.8	3.3	1.3	5.1	3.9		1.2	.7	2.5	5.7	1.5	3.0	
Neuroptera	.7		.4	1.4	.3											
Trichoptera	8.2	2.8	1.7	12.0	1.2	.6	1.2	1.0		.2	2.5	1.9		.9	1.7	
Lepidoptera				.3		.1	23.3						.3	.1		
Diptera	26.4	49.9	29.7	26.4	15.1	15.5	34.5	24.2	26.9	72.0	54.4		13.5	77.2	72.2	
Hymenoptera					.3	.1	2.5	1.1		1.0	.1			1.8	1.9	
Other <sup>1</sup>	.2	.4	.6	.3		.1	1.2	.4		.7	.1			.7	1.5	.6

<sup>1</sup>/ Other is the sum of all taxa that did not comprise more than 1 percent of the total number of organisms within that season.

### 2. Number of organisms and sample weights

Parameter	Benthic				Drift				Sticky				Water			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Number of samples	16	32	50	47	8	14	22	21	15	21	22		10	11	16	
Mean number of organisms per sample	91.6	121.4	137.9	278.6	42.1	221.7	63.8	393.9	40.1	280.7	98.1		80.3	653.6	138.3	
Minimum number of organisms per sample	6	1	1	12	6	11	5	2	5	18	17		1	130	5	
Maximum number of organisms per sample	356	459	526	1174	120	1125	501	3859	152	979	282		513	1770	336	
Mean sample weight(g)	.264	.052	.106	.355	.043	.043	.300	.074					.026	.299	.076	
Minimum sample weight(g)	.003	.000	.001	.012	.005	.004	.000	.003					.001	.021	.004	
Maximum sample	2.697	.248	1.121	2.318	.180	.185	3.525	.503					.067	.720	.166	





**Porter, Pamela E.; Meehan, William R.** Seasonal species composition of invertebrates in several Oregon streams. Res. Pap. PNW-RP-382. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station; 1987. 36 p.

The invertebrate communities of eight Oregon streams were sampled seasonally from 1974 to 1976. Benthic, drift, and two types of aerial-trap samples were collected. Occurrence and percentage composition are summarized by sample type, season, and geographic area (coastal, Cascade, central, and eastern Oregon). Within 276 families, 426 taxa were identified; the 20 families most prevalent within each sample type accounted for the majority of organisms collected (77.8-91.8 percent). In most areas and seasons, Diptera and Ephemeroptera together comprised over half of the invertebrates collected.

Keywords: Invertebrata, aquatic life, Oregon.

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